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PROPELLANT SURVEILLANCE REPORT MINUTEMAN III STAGE III,(U)
JUL 77 E M DALABA

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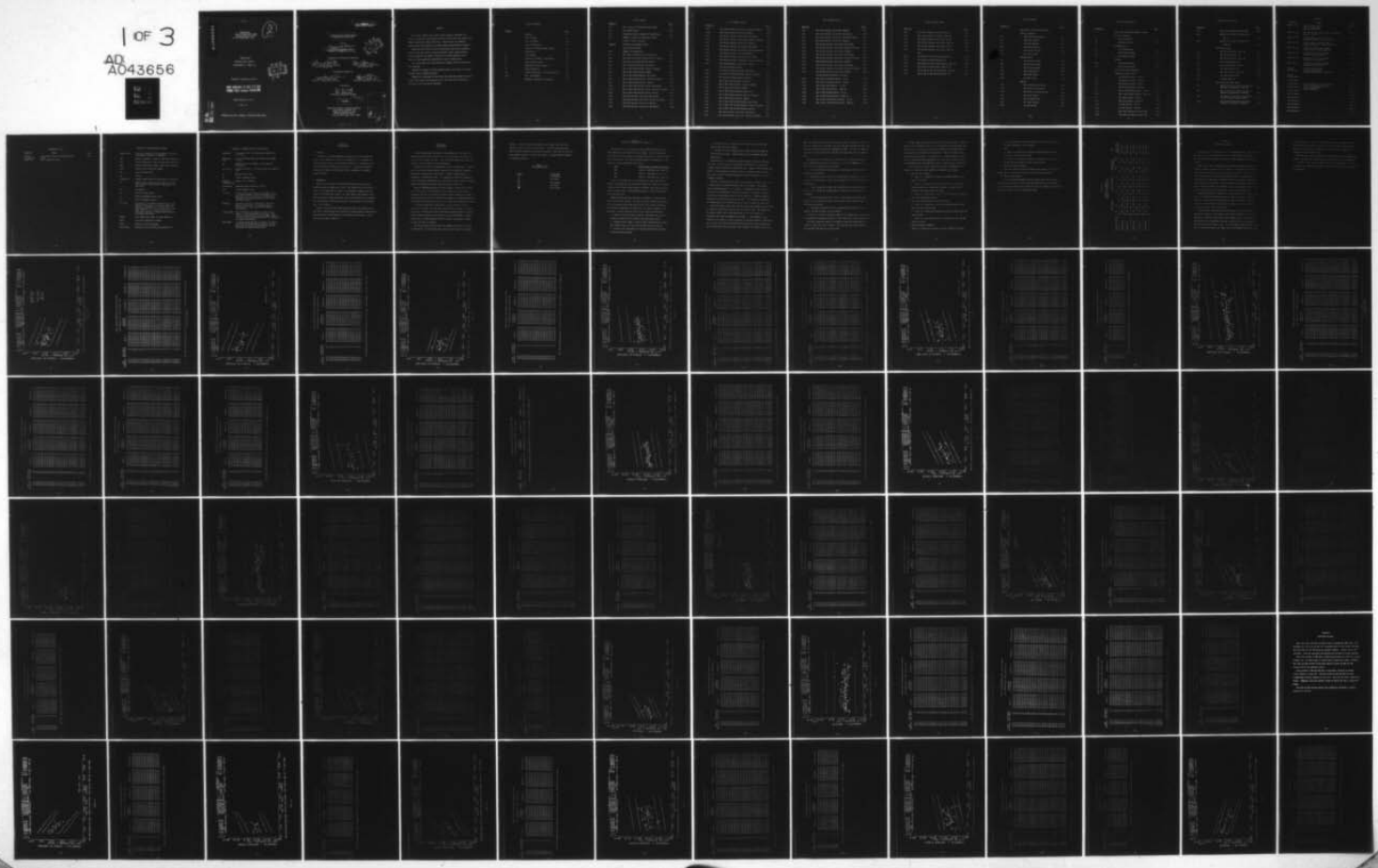

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PROPELLANT
SURVEILLANCE REPORT
MINUTEMAN III STAGE III

PROPELLANT LABORATORY SECTION

MANCP REPORT NR 374(77)

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MINUTEMAN III STAGE III

Author

Elizabeth M Dalaba

(10) ELIZABETH M. DALABA, Chemist
Component & Combustion Test Unit

Engineering & Statistical Review By

Glenn S. Porter

GLENN S. PORTER, Project Engineer
Service Engineering

Gary W. Redmond

GARY W. REDMOND, Statistician
Data Analysis Unit

Recommended Approval By

Leonidas A. Brown

LEONIDAS A. BROWN, Chief
Component & Combustion Test Unit

Ronald F. Larsen

RONALD F. LARSEN, Chief
Physical & Mechanical Test Unit

Approved By

Don F Woods

DON F. WOODS, Chief
Propellant Laboratory Section

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Industrial Products & Ldg Gear Division
Directorate of Maintenance
Ogden Air Logistics Center
United States Air Force
Hill Air Force Base, Utah 84406

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ABSTRACT

This report contains test results from testing of Minuteman III, Stage III propellant manufactured by Aerojet Solid Propulsion Company and Thiokol Corporation, Wasatch Division. These results are compared statistically with propellant of similar ages from Minuteman II Stage II.

Regressions are given for only statistically significant parameters from very low rate tensile, high rate biaxial tensile under pressure, stress relaxation and thermal coefficient of linear expansion tests. There are some significant regressions in each of these tests.

Case liner bonds also show significant changes which are potentially life limiting.

Significant changes in other parameters may be the result of limited testing, both in numbers and ages.

Analysis of covariance for test data from lined and unlined cartons of Stage II and Stage III propellant and for the four tests listed above are given in the statistical appendix.

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REFERENCES

Report Nr	Title	Date
MAGCP 75 (67)	Zero Time Test Results LGM-30 Second Stage Wing VI Propellant	13 Jan 67
MAGCP 111 (67)	ATP Test Results LGM-30 Stage II Propellant Wing VI, Phase I	1 Dec 67
MAGCP 142 (68)	ATP Test Results LGM-30, Stage II Propellant, Wing VI, Phase I Series II	Nov 68
MAGCP 188 (70)	ATP Test Results LGM-30, Stage II Propellant, Wing VI, Phase I Series II	Jul 70
MAGCP 212 (71)	Propellant Surveillance Report LGM-30 Stage II (Wing 6 ANB-3066)	Jun 71
MAGCP 240 (72)	Propellant Surveillance Report LGM-30F Stage II ANB-3066	May 72
MAGCP 256 (72)	Propellant Surveillance Report Minuteman III, Stage III	Oct 72
MANCP 331 (75)	Propellant Surveillance Report Minuteman III, Stage III	Oct 75
Aerojet 0162-AS-6-1A	Ten Year Aging Program for Wing VI Minuteman Second Stage Motors and Components	Sep 67
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Aerojet 0162-06-AS-F Appendix E	Final Report, Wing VI Minuteman Second Stage Motor Propellant Aging	Jan 74

GLOSSARY OF ABBREVIATIONS AND TERMS

Aging Trend	A change in properties of performance resulting from aging of material or component
ANA	Aerojet Propellant, Stage III (ANB 3066 Formulation)
ANT	Thiokol Propellant, Stage III (ANB 3066 Formulation)
ANB	Aerojet Propellant, Stage II (ANB 3066 Formulation)
ASPC	Aerojet Solid Propulsion Company
CSA	Cross Sectional Area
DB	Dogbone
Degradation	Gradual deterioration of properties or performance
E	Modulus (psi), defined as the slope of the line drawn tangent to the initial linear portion of the curve
EB	End Bonded
EGL	Effective Gage Length
e_m	Strain at Maximum Stress (in/in)
er	Strain at Rupture (in/in)
"F" ratio	The ratio of the variance accounted for by the regression function to the random unexplained variance. The regression function having the most significant "F" ratio is used for plotting data. The ratio is also used in detecting significant changes in random variation between succeeding time points.
JANNAF	Joint Army, Navy, NASA, Air Force Committee
MAGCP	Propellant Laboratory at OOAMA
OOALC	Ogden Air Logistics Command
Post Curing	Period up to 12-16 months after manufacture

GLOSSARY OF ABBREVIATIONS AND TERMS (CONT.)

Regression	The general form of the regression equation is $Y = a + bx$
Regression Line	Line representing mean test values with respect to time
S_b	Standard error of estimate of the regression coefficient
S_e or $S_{Y.X}$	Standard deviation of the data about the regression line
S_m	Maximum Stress (psi)
S_r	Stress at Rupture (psi)
Standard Deviation (S_y)	Square root of variance
Strain Rate	Crosshead speed divided by the EGL
TCC	Thiokol Chemical Corp.
"t" test	A statistical test used to detect significant differences between a measured parameter and an expected value of the parameter (determines if regression slope differs from zero at the 95% confidence level)
Variance	The sum of squares of deviations of the test results from the mean of the series after division by one less than the total number of test results
3 Sigma Band	The area between the upper and lower 3 sigma limit. It can be expected that 99.73% of the inventory represented by the test samples would fall within this range assuming that the population is normally distributed.
90-90 Band	It can be stated with 90% confidence that 90% of the inventory represented by the test samples would fall within this range assuming that the population is normally distributed

SECTION I
INTRODUCTION

A. PURPOSE:

The purpose of testing ANB-3066 propellant, used in Minuteman II Stage II and Minuteman III Stage II and Stage III, is to monitor and evaluate aging effects on this propellant which will contribute to the operational motor serviceability prediction. Testing was performed according to General Test Directive GTD-2C, Amendment 1, and MMWR Project M83257C.

B. BACKGROUND:

Service life testing of ANB-3066 carton propellant from Aerojet production began at Ogden ALC in 1966. When production for Minuteman III Stage II was transferred to Thiokol, the propellant samples from both Aerojet and Thiokol were tested. As lined cartons were produced these also were tested, adding propellant liner bond specimens to the program. The current report contains data from all these sources for propellant aged 13 to 72 months.

Failure criteria for ANB 3066 propellant which were developed from structural stress analysis are reiterated in Aerojet Report 0162-06SAAS-17. Inner bore hoop strain failure is the predicted failure mode. These criteria are shown in Table 1-1.

SECTION II
TEST PROGRAM

Cartons representing raw material combinations were subjected to a random selection process designed to test all material lots within a two year-four test periods interval. When propellant cartons have been aged one year, they are added to the test program.

Propellant cartons are identified by source of manufacture. Stage II and III propellant manufactured by Aerojet Solid Propulsion Company is identified as ANB and ANA respectively. Thiokol Company Stage III propellant is identified as ANT. All regressions used this nomenclature and the additional information as to the type of carton, lined or unlined. Symbols identifying the carton types are given in Table 2-1.

Stage II ANB-3066 propellant has been tested for more than 10 years, but in this report only propellant up to 72 months has been used in covariance analysis to coincide with the age span of Stage III propellant. Lined and unlined cartons of ANB have been combined in regression analysis for comparison purposes and cover the time span from 13 through 137 months.

The physical-mechanical tests which relate directly to stress analysis are limited. Very low rate tensile test is related to storage conditions, and high rate rails tested under pressure relate to ignition. Stress relaxation modulus also relates to storage conditions. Thermal coefficient of linear expansion reflects some of the thermal stresses to which the motor is exposed.

Low rate uniaxial tensile tests and hardness are routine tests for all propellant. The data from these tests do not relate to structural

analyses. Poisson's ratio and cohesive tear energy tests have been applied to only a portion of the cartons. The data from these tests have not been subjected to statistical analyses. Test data for all these tests appear similar to previous test data. All these data will appear in subsequent reports.

TABLE 2 - 1
PLOT SYMBOL LEGEND

Symbol	Carton Type
□	ANA Unlined
△	ANB Lined
×	ANB Unlined
◇	ANT Lined
✳	ANT Unlined

SECTION III
STATISTICAL SUMMARY AND CONCLUSIONS

Data analyses of all propellant tested by MANCP having the ANB 3066 formulation are contained in this report. ANB 3066 propellant is divided into three groups, each group pertaining to a specific rocket motor application. The three propellant groups are designated in this report by a three letter code as follows:

Code	Manufacturer and System Application
ANA	Aerojet: MINUTEMAN III, Stage III
ANB	Aerojet: MINUTEMAN II, Stage II
ANT	Thiokol: MINUTEMAN III, Stage III

Propellant specimens for the ANA group were taken from unlined cartons. Specimens for the ANB and ANT groups were taken from unlined cartons and also from cartons having a simulated case liner along one surface of the carton. Each propellant group is further sub-divided into propellant lots.

Laboratory test data were studied to determine if lined cartons differ from unlined cartons. The data were also examined to determine if the propellant groups (ANA, ANB and ANT) differ among themselves. The following comparisons, as directed by the project engineer, were performed to satisfy periodic service life estimate requirements:

1. Compare lined and unlined cartons of MINUTEMAN III Stage III propellant manufactured by Thiokol (ANT propellant group).
2. Compare Aerojet Stage II lined cartons (ANB propellant group) with Thiokol Stage III lined cartons (ANT propellant group).
3. Perform joint comparisons for unlined cartons from ANA, ANB and ANT propellant groups.

4. Perform lot-to-lot comparisons for unlined cartons from ANA, ANB and ANT propellant groups.

5. Perform lot-to-lot comparisons for lined cartons from ANB and ANT propellant groups. (Lined cartons are not available for ANA propellant).

Propellant age is considered a possible source of bias in laboratory test data. That is, part of the observed differences in a given test response might be ascribed to propellant age. Because of the possible age effect it was necessary to provide a means of analysis where the bias, or age effect, could be removed allowing an unbiased evaluation of the true parameter response.

Analysis of covariance was chosen as the method to determine the effect or "significance" of propellant age on the test response. The general linear regression model, $Y = a + b(X_{ij})$, is modified for the analysis of covariance by introducing a "correction term" into the model to adjust the data for the average effect of the variable X_{ij}. Propellant age was assigned to the variable X_{ij} in this report. The F ratio for determing the significance of the propellant age is shown in Tables A-1 thru A-74.

Similarity among carton types and among propellant groups was determined by comparing regression lines for each of the data sets. The purpose was to examine whether the linear regressions of the test response on propellant age could be regarded as the same. It is possible for the regressions to differ in slope, intercept or residual variance. Differences due to slope could indicate dissimilar aging characteristics among groups while differences due to intercept could indicate bias among the data sets.

When the regression lines were statistically similar (slopes and intercepts were not significantly different) the data sets were accepted as being equal and were combined to provide an expanded data base. A "total" or composite regression line was then used to estimate the aging trend for the combined data.

The results of the analysis of covariance used in making propellant group comparisons (previously discussed on p. 3-1) are summarized in Table A-A of the appendix and as follows:

a. ANT lined and unlined cartons are significantly different for all observed test parameters.

b. ANB and ANT lined cartons are significantly different for all test parameters except modulus on very low rate tensile (2×10^{-4} in/min crosshead speed).

c. Joint comparisons of ANA, ANB, and ANT unlined cartons indicate that the three groups are significantly different for all observed test parameters.

d. The individual propellant lots are significantly different (with respect to the observed test data) for unlined cartons from ANA, ANB, and ANT propellant groups.

e. Individual propellant lots are significantly different for lined cartons from ANB and ANT propellant groups.

Analysis of covariance tables included in the appendix may be consulted for information relating to specific F tests used in the above comparisons.

ANB 3066 propellant exhibits incomplete curing and inconsistent test results if aged less than 13 months. All data aged less than 13 months was excluded from analysis in this report.

In those cases where test data from various carton types or propellant groups could be combined, plots of the combined data and regression lines are provided. Carton types or propellant groups are differentiated on these plots with different plotting symbols. These are shown in the applicable test sections. In addition to the combined regression plots, plots of individual group regression lines have been provided for each test parameter where the regression slope is statistically significant.

The results of the linear regression analysis are summarized in Table 3-1. From this table, several conclusions can be drawn.

1. Very low rate tensile:

   a. There is a singificant increase in maximum stress for all types of ANB 3066.

   b. There is a significant decrease in strain at rupture for lined cartons but a singificant increase in unlined cartons except for ANA which showed no change.

   c. There is a significant increase in modulus for ANB lined and ANT lined and unlined cartons.

2. High rate triaxial (rails under 600 psi N_2):

   a. There is a significant increase in maximum stress for all types of cartons except ANA.

   b. There is a significant decrease in strain at rupture for ANT lined cartons.

   c. There is a significant decrease in modulus for ANA and ANB unlined cartons.

3. Stress Relaxation Modulus:

   There is a significant increase in stress relaxation modulus

for ANA and ANB unlined cartons and ANT lined cartons, indicating increased hardness in the propellant.

4. TCLE:

   a. There is a significant increase in TCLE above glass point except for lined cartons of ANB.

   b. There is a significant decrease in glass point for all ANT cartons and an increase for ANB unlined cartons.

5. Case Liner Bond Specimens:

Interface tensile and shear specimens show signs of early failure in some lots. These lots still must be more fully characterized.

6. Testing Conclusions:

The testing shows changes which are potentially life-limiting in the case of liner bonds. Other significant parameters may not present this problem since there is the possibility that the changes are significant because of limited testing in numbers and ages.

TABLE 3-1

REGRESSION ANALYSIS
SUMMARY OF SIGNIFICANCE

	VLR Tensile			HR Triax Tensile			Stress Relax 1% Strain		TCLE	
Propellant Group	Sm	er	E	Sm	er	E	E_{10}	E_{1000}	TCLE Above	Glass Point
ANA(Unlined)	Sig	N.S.	N.S.	N.S.	N.S.	Sig	Sig	Sig	Sig	N.S.
ANB(Lined)	Sig	Sig	Sig	Sig	N.S.	N.S.	N.S.	N.S.	Sig	N.S
ANB(Unlined)	Sig	Sig	N.S.	Sig	N.S.	Sig	Sig	Sig	N.S.	Sig
ANT(Lined)	Sig	Sig	Sig	Sig	Sig	N.S.	Sig	Sig	Sig	Sig
ANT(Unlined)	Sig	Sig	Sig	Sig	N.S.	N.S.	N.S.	N.S.	Sig	Sig

SECTION IV

VERY LOW RATE TENSILE

This test uses a 1/2 inch thick (1.27 cm) JANNAF dogbone. The specimens are tested at a crosshead speed of 2×10^{-4} in/min (8.5×10^{-2} cm/sec). Very low rate tensile testing is related to strain capability for storage at 60°F.

Lined cartons show a statistically significant decrease in strain at rupture as shown in Figures 4-1, 4-2, and 4-3. The slope for the combined lined samples is less than for ANB lined cartons alone. Unlined cartons of ANB and ANT show a significant increase in strain at rupture with the slope greater for ANT than for ANB while ANA does not show a significant change (Figures 4-4 and 4-5). Strain at rupture for combined lined and unlined cartons of ANB up to 137 months shows a significant increase based upon the preponderance of unlined over lined cartons (Figure 4-6).

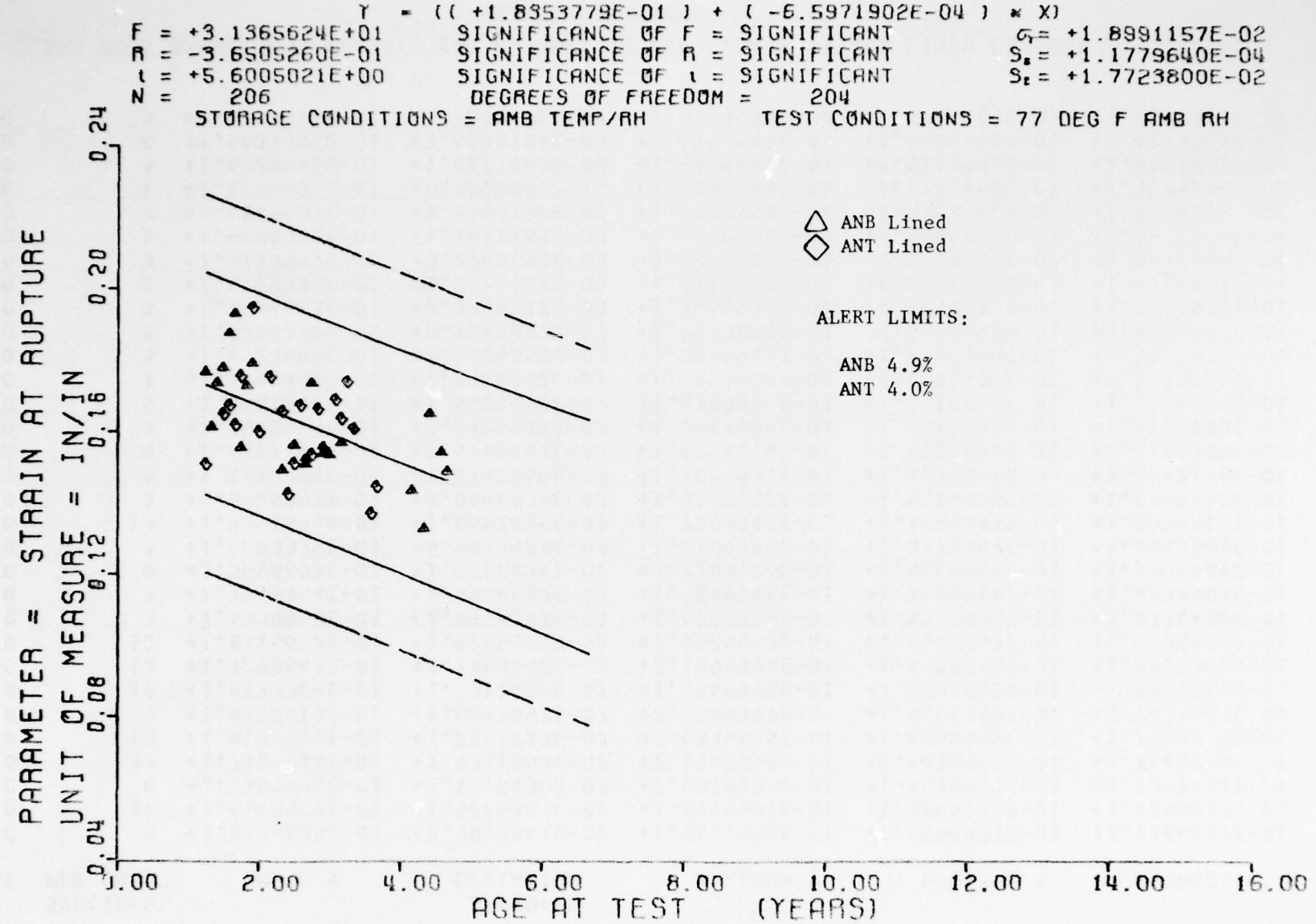
Maximum stress shows a significant increase (Figures 4-7 through 4-12). Slopes for ANB and ANT unlined cartons are steeper than for ANA with ANT steepest. Slopes for ANB and ANT lined cartons are similar. When ANB lined and unlined cartons are combined the slope is less than for ANB unlined and greater than for ANB lined.

There are three combinable groups for modulus, two of which have a significant increase. ANB unlined cartons and ANA unlined cartons when combined do not show a significant trend (Figure 4-13). Lined cartons of ANB and ANT show a significant increase (Figure 4-14) as do unlined and lined cartons of ANT (Figure 4-15). In this combined regression the slope and the standard deviation are larger than for dissimilar sources of lined

propellant cartons. There is a significant increase in modulus for ANB lined cartons and ANT unlined and lined cartons (Figures 4-16 thru 4-18). When ANB lined cartons are combined with unlined cartons, there is no significant change (Figure 4-19).

From the data cited, the similarity between lined cartons from different sources is greater than between unlined cartons from the same manufacturer.

At least for very low rate tensile testing, the conclusion that carton preparation has a greater influence on data than the source of the propellant is inescapable.



ANB 3066 PROPELLANT TENSILE CHS 0.0002, 77 DEG F, ANB VS ANT LINED CARTONS

Strain at Rupture

Figure 4-1

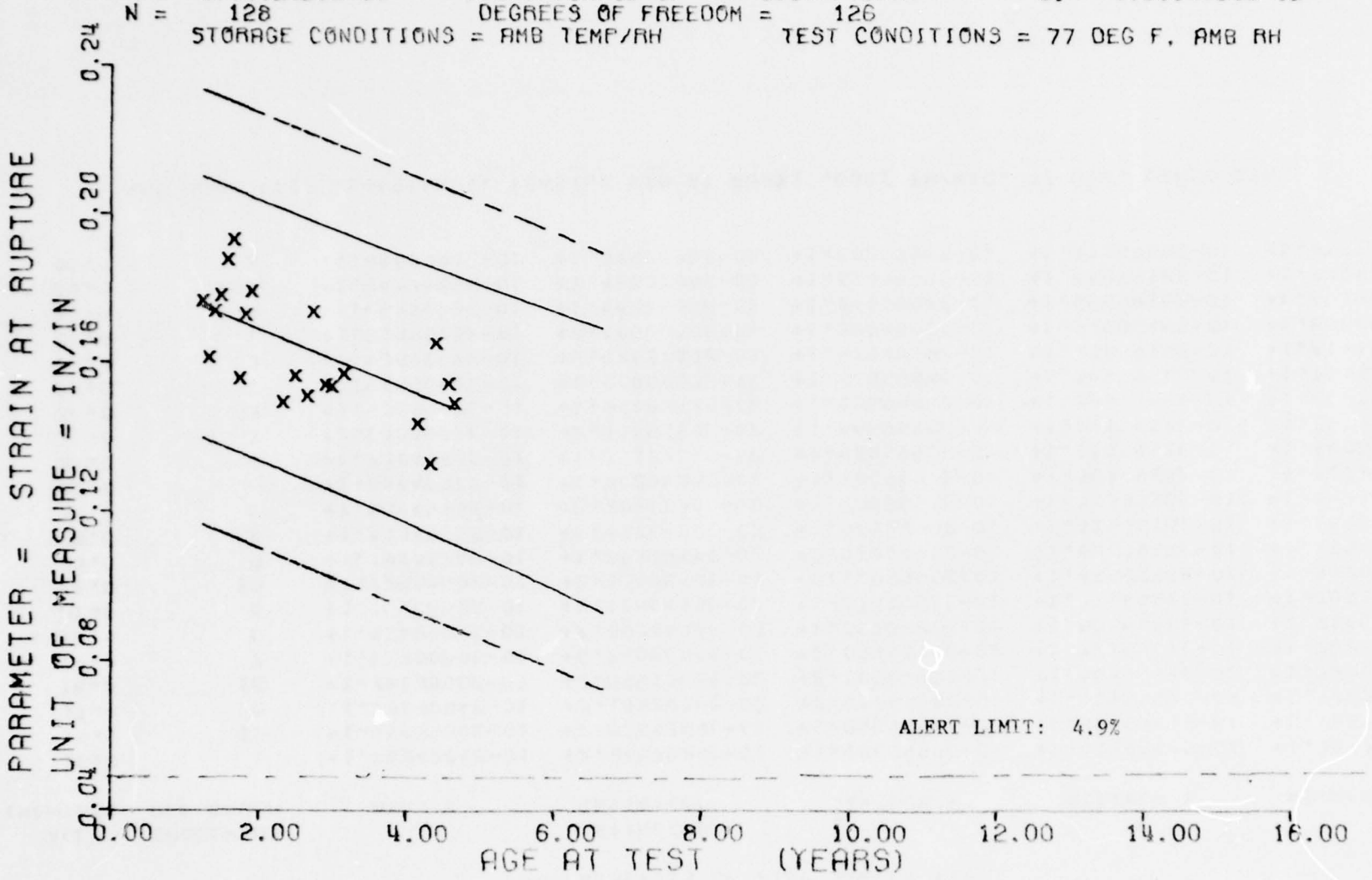
****** LINEAR REGRESSION ANALYSIS ******

***** ANALYSIS OF TIME SERIES *****

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
15.0	9	+1.6826635E-01	+2.3028661E-02	+1.9889998E-01	+1.3599997E-01	+1.7364197E-01
16.0	15	+1.6143959E-01	+1.5265309E-02	+1.8949997E-01	+1.3299995E-01	+1.7298227E-01
17.0	6	+1.7389994E-01	+3.1955430E-02	+2.0879995E-01	+1.4099997E-01	+1.7232251E-01
18.0	22	+1.7459964E-01	+1.9351452E-02	+2.1869999E-01	+1.4639997E-01	+1.7166280E-01
19.0	10	+1.8173956E-01	+1.2854719E-02	+2.0339995E-01	+1.6089999E-01	+1.7100310E-01
20.0	9	+1.8283319E-01	+1.6847592E-02	+2.0599997E-01	+1.5559995E-01	+1.7034339E-01
21.0	12	+1.6573309E-01	+1.7372682E-02	+1.9569998E-01	+1.3799995E-01	+1.6968363E-01
22.0	12	+1.7296648E-01	+2.1349542E-02	+2.1099996E-01	+1.4799994E-01	+1.6902393E-01
23.0	12	+1.8316632E-01	+1.4225626E-02	+2.0529997E-01	+1.6649997E-01	+1.6836422E-01
24.0	3	+1.6009998E-01	+2.4955283E-03	+1.6209995E-01	+1.5729999E-01	+1.6770452E-01
26.0	3	+1.7569994E-01	+1.3908482E-03	+1.7649996E-01	+1.7409998E-01	+1.6638505E-01
28.0	9	+1.5496653E-01	+1.0318834E-02	+1.7289996E-01	+1.4159995E-01	+1.6506564E-01
29.0	3	+1.4283329E-01	+4.9059905E-03	+1.4759999E-01	+1.3779997E-01	+1.6440588E-01
30.0	12	+1.5391635E-01	+1.6652499E-02	+1.7909997E-01	+1.3439995E-01	+1.6374617E-01
31.0	3	+1.6769993E-01	+2.0656898E-02	+1.9089996E-01	+1.5129995E-01	+1.6308647E-01
32.0	9	+1.5139979E-01	+1.5757940E-02	+1.7009997E-01	+1.3079994E-01	+1.6242676E-01
33.0	9	+1.6717749E-01	+1.4342507E-02	+1.8899995E-01	+1.4939999E-01	+1.6176700E-01
34.0	3	+1.6669994E-01	+1.0420559E-02	+1.7419999E-01	+1.5479999E-01	+1.6110730E-01
35.0	6	+1.5481662E-01	+1.5489440E-02	+1.6889995E-01	+1.2619996E-01	+1.6044759E-01
36.0	3	+1.5359997E-01	+1.2928842E-02	+1.6359996E-01	+1.3899999E-01	+1.5978789E-01
37.0	3	+1.6929996E-01	+9.3604663E-03	+1.7889994E-01	+1.6019999E-01	+1.5912812E-01
38.0	7	+1.6294270E-01	+5.7787097E-03	+1.7189997E-01	+1.5699994E-01	+1.5846842E-01
39.0	3	+1.7426663E-01	+2.3238322E-03	+1.7689996E-01	+1.7249995E-01	+1.5780872E-01
40.0	3	+1.6123330E-01	+5.5228477E-03	+1.6719996E-01	+1.5629994E-01	+1.5714901E-01
43.0	3	+1.3739997E-01	+3.2200491E-03	+1.3999998E-01	+1.3379997E-01	+1.5516984E-01
44.0	3	+1.4493328E-01	+1.1631360E-03	+1.4619994E-01	+1.4389997E-01	+1.5451014E-01
50.0	3	+1.4369994E-01	+8.6483720E-03	+1.5299999E-01	+1.3589996E-01	+1.5055179E-01
52.0	1	+1.3299995E-01	+0.0000000E+19	+1.3299995E-01	+1.3299995E-01	+1.4923238E-01
53.0	3	+1.6529995E-01	+1.6627560E-02	+1.8449997E-01	+1.5569996E-01	+1.4857262E-01
55.0	4	+1.5437495E-01	+7.4682704E-03	+1.6199994E-01	+1.4499998E-01	+1.4725321E-01
56.0	3	+1.4909994E-01	+1.3692575E-03	+1.5029996E-01	+1.4759999E-01	+1.4659351E-01

ANB 3066 PROPELLANT TENSILE CHS 0.0002, 77 DEG F, ANB VS ANT LINED CARTONS

STRAIN AT RUPTURE



ANB 3066 PROPELLANT (ANB), TENSILE STN AT RUPT, .0002 IN/MIN, 77 DEG, LINED CTN

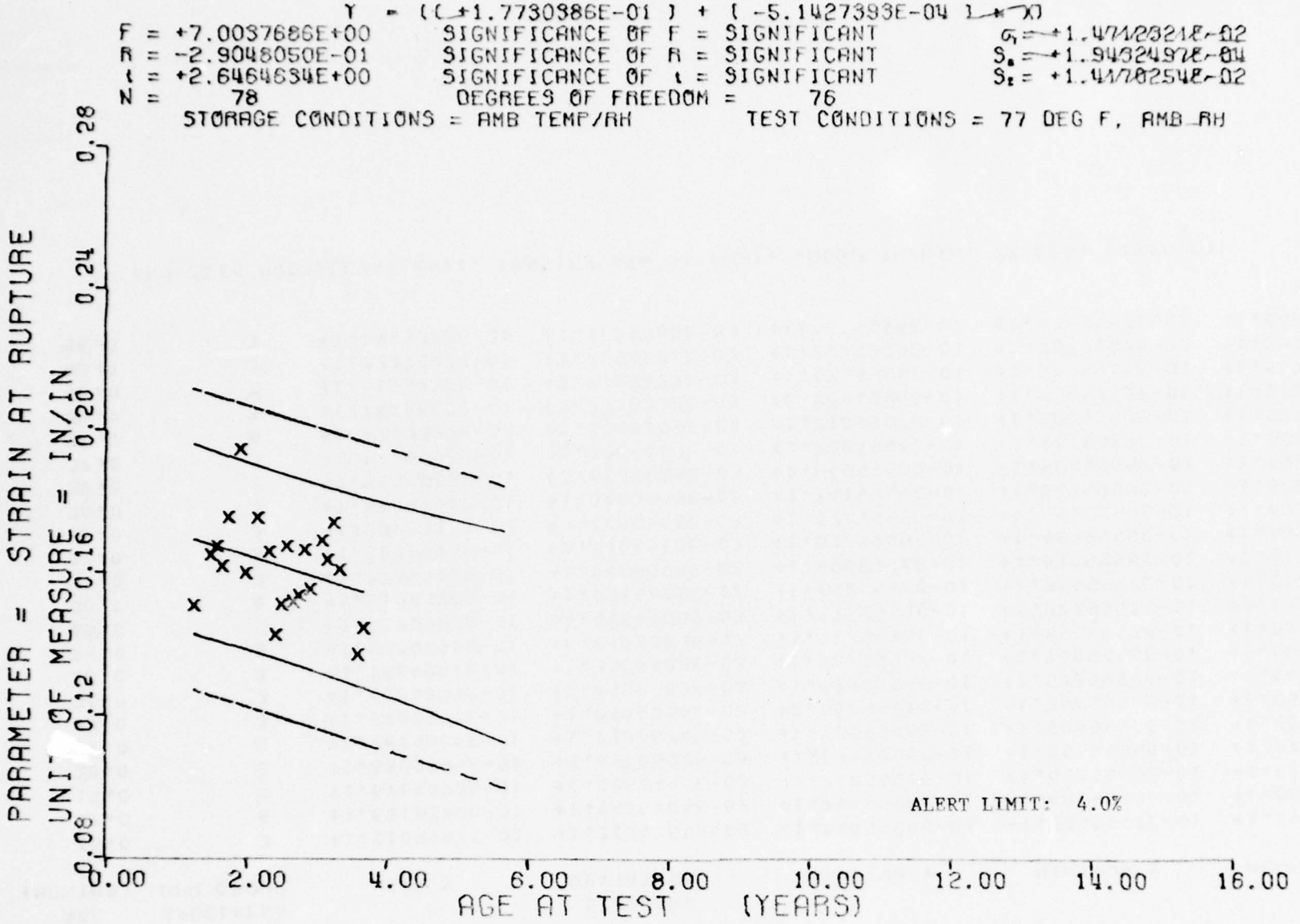
Figure 4-2

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
15.0	6	+1.7684984E-01	+2.2687529E-02	+1.9889998E-01	+1.4129996E-01	+1.7497479E-01
16.0	15	+1.6143959E-01	+1.5265309E-02	+1.8949997E-01	+1.3299995E-01	+1.7430168E-01
17.0	6	+1.7389994E-01	+3.1555430E-02	+2.0879995E-01	+1.4099997E-01	+1.7362856E-01
18.0	16	+1.7813098E-01	+2.0951301E-02	+2.1869999E-01	+1.4639997E-01	+1.7295545E-01
19.0	7	+1.8775689E-01	+9.7106640E-03	+2.0339995E-01	+1.7729997E-01	+1.7228233E-01
20.0	6	+1.9319993E-01	+7.3034406E-03	+2.0599997E-01	+1.8669998E-01	+1.7160922E-01
21.0	6	+1.5566658E-01	+1.1286418E-02	+1.6799998E-01	+1.3799995E-01	+1.7093610E-01
22.0	12	+1.7296648E-01	+2.1349542E-02	+2.1099996E-01	+1.4799994E-01	+1.7026299E-01
23.0	9	+1.7925524E-01	+1.3539914E-02	+2.0199996E-01	+1.6649997E-01	+1.6958987E-01
28.0	6	+1.4539993E-01	+6.4276420E-03	+1.5839999E-01	+1.4159995E-01	+1.6622436E-01
30.0	6	+1.5654993E-01	+2.1011330E-02	+1.7909997E-01	+1.3439995E-01	+1.6487812E-01
32.0	6	+1.5104997E-01	+1.9623435E-02	+1.7009997E-01	+1.3079994E-01	+1.6353189E-01
33.0	6	+1.7384988E-01	+1.2733701E-02	+1.8899995E-01	+1.6109997E-01	+1.6285884E-01
35.0	3	+1.5406662E-01	+2.4149953E-02	+1.6889995E-01	+1.2619996E-01	+1.6151261E-01
36.0	3	+1.5359997E-01	+1.2928842E-02	+1.6359996E-01	+1.3899999E-01	+1.6083949E-01
38.0	1	+1.5699994E-01	+0.0000000E+71	+1.5699994E-01	+1.5699994E-01	+1.5949326E-01
50.0	3	+1.4369994E-01	+8.6483720E-03	+1.5299999E-01	+1.3589996E-01	+1.5141594E-01
52.0	1	+1.3299995E-01	+0.0000000E+79	+1.3299995E-01	+1.3299995E-01	+1.5006977E-01
53.0	3	+1.6529995E-01	+1.6627560E-02	+1.8449997E-01	+1.5569996E-01	+1.4939665E-01
55.0	4	+1.5437495E-01	+7.4682704E-03	+1.6199994E-01	+1.4499998E-01	+1.4805042E-01
56.0	3	+1.4909994E-01	+1.3692575E-03	+1.5029996E-01	+1.4759999E-01	+1.4737731E-01

ANB 3066 PROPELLANT(ANB), TENSILE STN AT RUPT, .0002 IN/MIN, 77 DEG, LINED CTN



ANB 3066 PROPELLANT(ANT), TENSILE STN AT RUPT, .0002 IN/MIN, 77 DEG, LINED CTN

Figure 4-3

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
15.0	3	+1.5109997E-01	+1.3084754E-02	+1.5909999E-01	+1.3599997E-01	+1.6958969E-01
18.0	6	+1.6518330E-01	+1.0459464E-02	+1.7649996E-01	+1.4849996E-01	+1.6804689E-01
19.0	3	+1.6769993E-01	+6.1568143E-03	+1.7289996E-01	+1.6089999E-01	+1.6753262E-01
20.0	3	+1.6209995E-01	+5.8940502E-03	+1.6709995E-01	+1.5559995E-01	+1.6701835E-01
21.0	6	+1.7579984E-01	+1.7125674E-02	+1.9569998E-01	+1.5469998E-01	+1.6650408E-01
23.0	3	+1.9489997E-01	+1.0204350E-02	+2.0529997E-01	+1.8489998E-01	+1.6547554E-01
24.0	3	+1.6009998E-01	+2.4555283E-03	+1.6209995E-01	+1.5729999E-01	+1.6496127E-01
26.0	3	+1.7569994E-01	+1.3908482E-03	+1.7649996E-01	+1.7409998E-01	+1.6393274E-01
28.0	3	+1.6609996E-01	+6.6102383E-03	+1.7289996E-01	+1.5969997E-01	+1.6290414E-01
29.0	3	+1.4283329E-01	+4.9059905E-03	+1.4759999E-01	+1.3779997E-01	+1.6238987E-01
30.0	6	+1.5128326E-01	+1.2319588E-02	+1.6929996E-01	+1.3599997E-01	+1.6187560E-01
31.0	3	+1.6769993E-01	+2.0656898E-02	+1.9089996E-01	+1.5129995E-01	+1.6136133E-01
32.0	3	+1.5209996E-01	+5.4104013E-03	+1.5729999E-01	+1.4649999E-01	+1.6084706E-01
33.0	3	+1.5383327E-01	+4.0680505E-03	+1.5739995E-01	+1.4939999E-01	+1.6033279E-01
34.0	3	+1.6669994E-01	+1.0420559E-02	+1.7419999E-01	+1.5479999E-01	+1.5981853E-01
35.0	3	+1.5556663E-01	+3.8638024E-03	+1.5999996E-01	+1.5289998E-01	+1.5930426E-01
37.0	3	+1.6929996E-01	+9.3604663E-03	+1.7889994E-01	+1.6019999E-01	+1.5827572E-01
38.0	6	+1.6393327E-01	+5.6388109E-03	+1.7189997E-01	+1.5869998E-01	+1.5776145E-01
39.0	3	+1.7426663E-01	+2.3238322E-03	+1.7689996E-01	+1.7249995E-01	+1.5724712E-01
40.0	3	+1.6123330E-01	+5.5228477E-03	+1.6719996E-01	+1.5629994E-01	+1.5673285E-01
43.0	3	+1.3739997E-01	+3.2200491E-03	+1.3999998E-01	+1.3379997E-01	+1.5519005E-01
44.0	3	+1.4493328E-01	+1.1631360E-03	+1.4619994E-01	+1.4389997E-01	+1.5467578E-01

ANB 3066 PROPELLANT(ANT), TENSILE STN AT RUPT, .0002 IN/MIN, 77 DEG, LINED CTN

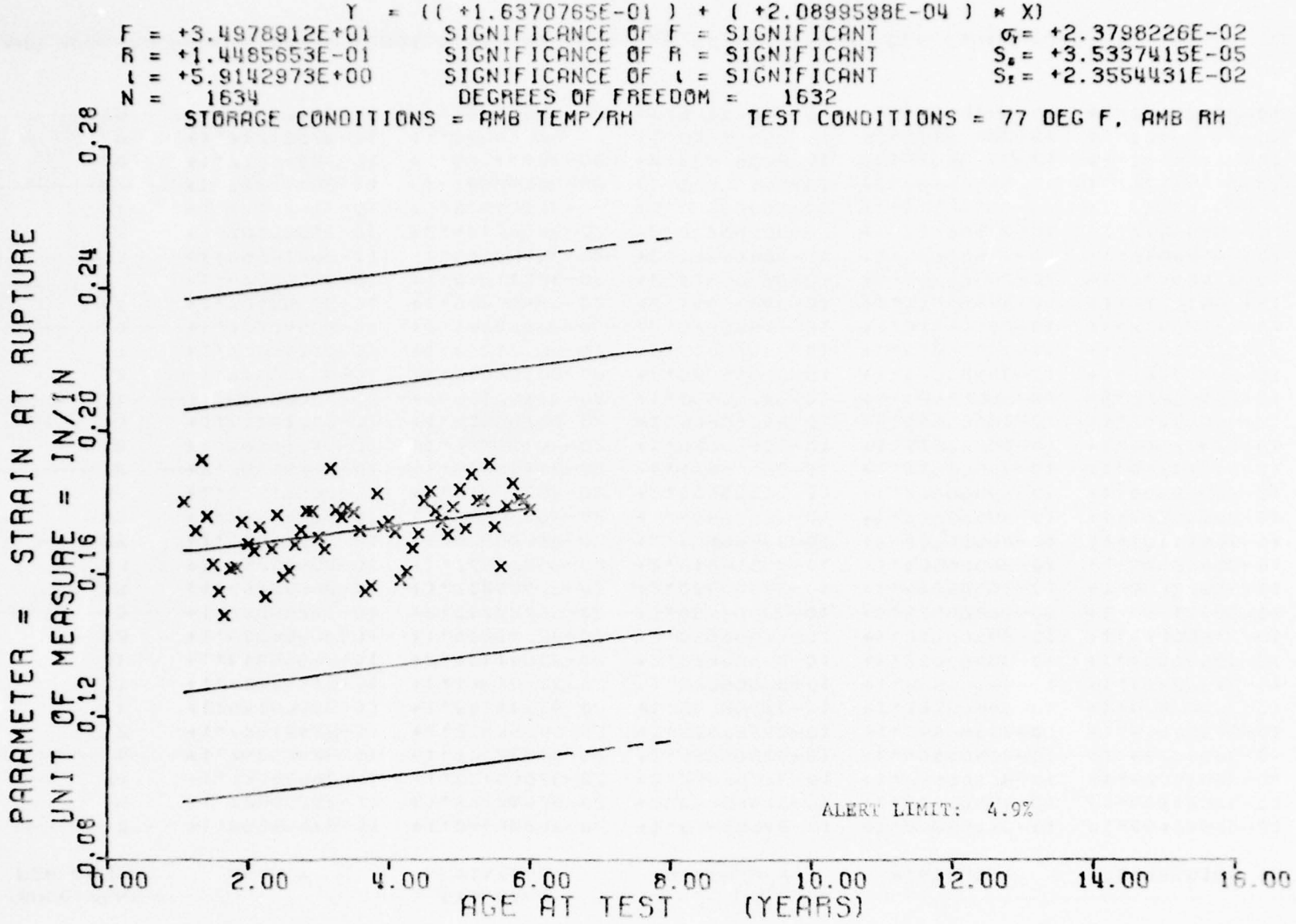

Y = ((+1.6370765E-01) + (+2.0899598E-04) * X)
F = +3.4978912E+01 SIGNIFICANCE OF F = SIGNIFICANT σr = +2.3798226E-02
R = +1.4485653E-01 SIGNIFICANCE OF R = SIGNIFICANT Sa = +3.5337415E-05
t = +5.9142973E+00 SIGNIFICANCE OF t = SIGNIFICANT Sr = +2.3554431E-02
N = 1634 DEGREES OF FREEDOM = 1632
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = 77 DEG F, AMB RH
PARAMETER = STRAIN AT RUPTURE
UNIT OF MEASURE = IN/IN
0.08
0.12
0.16
0.20
0.24
0.28
ALERT LIMIT: 4.9%
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
ANB 3066 PROPELLANT(ANB) TENSILE STN AT RUPT, .0002 IN/MIN, 77 DEG F, UNLND CTNS

Figure 4-4

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
13.0	7	+1.8035697E-01	+1.0419620E-02	+1.9399994E-01	+1.6823557E-01	+1.6642457E-01
15.0	15	+1.7226524E-01	+1.8327683E-02	+2.0599997E-01	+1.5199955E-01	+1.6584257E-01
16.0	30	+1.9339289E-01	+1.9015996E-02	+2.2399997E-01	+1.6339957E-01	+1.6705155E-01
17.0	15	+1.7625302E-01	+1.1743220E-02	+1.9399994E-01	+1.4999957E-01	+1.6726052E-01
18.0	12	+1.6291642E-01	+2.2963594E-02	+1.9399994E-01	+1.2689955E-01	+1.6746956E-01
19.0	11	+1.5526336E-01	+1.8414152E-02	+1.9599997E-01	+1.3329994E-01	+1.6767853E-01
20.0	21	+1.4870917E-01	+1.1763641E-02	+1.7839998E-01	+1.2559998E-01	+1.6788756E-01
21.0	31	+1.6169959E-01	+2.4511490E-02	+2.0799994E-01	+1.2399955E-01	+1.6809654E-01
22.0	23	+1.6202569E-01	+1.9725423E-02	+2.0599997E-01	+1.2479996E-01	+1.6830551E-01
23.0	10	+1.7485976E-01	+2.0877204E-02	+2.0849996E-01	+1.5299999E-01	+1.6851454E-01
24.0	15	+1.6870629E-01	+1.7220843E-02	+2.0289999E-01	+1.4199955E-01	+1.6872352E-01
25.0	33	+1.6670566E-01	+1.7064729E-02	+2.0199996E-01	+1.4399999E-01	+1.6893249E-01
26.0	27	+1.7354774E-01	+1.9385037E-02	+2.1999996E-01	+1.4239996E-01	+1.6914153E-01
27.0	22	+1.5395407E-01	+1.8593140E-02	+1.9889998E-01	+1.2399955E-01	+1.6935050E-01
28.0	30	+1.6731959E-01	+2.3181709E-02	+2.0599997E-01	+1.2799996E-01	+1.6955953E-01
29.0	12	+1.7676639E-01	+1.5399611E-02	+1.9799995E-01	+1.5199995E-01	+1.6976851E-01
30.0	10	+1.5939974E-01	+1.7129615E-02	+1.8399995E-01	+1.3199996E-01	+1.6997748E-01
31.0	13	+1.6116124E-01	+1.4255979E-02	+1.9399994E-01	+1.3999998E-01	+1.7018651E-01
32.0	21	+1.6835200E-01	+1.6067091E-02	+1.9599997E-01	+1.4399999E-01	+1.7039549E-01
33.0	33	+1.7249047E-01	+1.4692510E-02	+2.0869994E-01	+1.4799954E-01	+1.7060446E-01
34.0	17	+1.7789971E-01	+1.8221263E-02	+2.1199995E-01	+1.5599995E-01	+1.7081350E-01
35.0	20	+1.7790460E-01	+1.9430782E-02	+2.0799994E-01	+1.3759954E-01	+1.7102247E-01
36.0	44	+1.7046546E-01	+1.9420644E-02	+2.1409994E-01	+1.2799996E-01	+1.7123150E-01
37.0	26	+1.6708803E-01	+1.9481163E-02	+2.1199995E-01	+1.2999999E-01	+1.7144048E-01
38.0	33	+1.8968129E-01	+1.6402384E-02	+2.1799999E-01	+1.6299959E-01	+1.7164945E-01
39.0	12	+1.7808306E-01	+2.4213908E-02	+2.0499998E-01	+1.2799996E-01	+1.7185848E-01
40.0	27	+1.7613297E-01	+1.8344596E-02	+2.0599999E-01	+1.1799997E-01	+1.7206746E-01
41.0	22	+1.7872679E-01	+1.1688693E-02	+1.9799995E-01	+1.4799954E-01	+1.7227643E-01
42.0	20	+1.7748463E-01	+1.5714440E-02	+2.1069997E-01	+1.5199955E-01	+1.7248547E-01
43.0	9	+1.7231088E-01	+1.2659257E-02	+1.9299995E-01	+1.5119999E-01	+1.7269444E-01
44.0	25	+1.5532362E-01	+1.9235538E-02	+1.9679995E-01	+1.1399996E-01	+1.7290341E-01

AND 3066 PROPELLANT(ANB) TENSILE STR AT RUPT, .002 IN/MIN, 77 DEG F, UNLND CINS

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
45.0	20	+1.5686964E-01	+2.2092980E-02	+1.9399994E-01	+1.1999994E-01	+1.7311245E-01
46.0	44	+1.8271321E-01	+2.1218051E-02	+2.3599994E-01	+1.4199995E-01	+1.7332142E-01
47.0	12	+1.7349570E-01	+1.7237205E-02	+1.9769996E-01	+1.4599996E-01	+1.7353045E-01
48.0	20	+1.7503958E-01	+2.0194668E-02	+1.9699996E-01	+1.1279994E-01	+1.7373943E-01
49.0	22	+1.7188596E-01	+2.4555513E-02	+2.3999994E-01	+1.1399996E-01	+1.7394840E-01
50.0	29	+1.5849274E-01	+3.0820163E-02	+2.2399997E-01	+1.0399997E-01	+1.7415744E-01
51.0	57	+1.6100651E-01	+3.0070103E-02	+2.1999996E-01	+9.9999964E-02	+1.7436641E-01
52.0	50	+1.6742753E-01	+1.7781341E-02	+2.1959996E-01	+1.2199997E-01	+1.7457538E-01
53.0	37	+1.7157793E-01	+1.7770688E-02	+2.0039999E-01	+1.3269996E-01	+1.7478442E-01
54.0	19	+1.8073648E-01	+2.3754936E-02	+2.1599996E-01	+1.3689994E-01	+1.7499339E-01
55.0	44	+1.8339729E-01	+2.3733086E-02	+2.2199994E-01	+1.2399995E-01	+1.7520242E-01
56.0	59	+1.7787408E-01	+2.3440098E-02	+2.3299998E-01	+1.0999995E-01	+1.7541140E-01
57.0	46	+1.7475599E-01	+2.0669052E-02	+2.0799994E-01	+1.2719994E-01	+1.7562037E-01
58.0	14	+1.7132306E-01	+1.7440113E-02	+2.0999997E-01	+1.2799996E-01	+1.7582941E-01
59.0	20	+1.7899960E-01	+1.6830856E-02	+2.0799994E-01	+1.5799999E-01	+1.7603838E-01
60.0	20	+1.8389958E-01	+1.6396725E-02	+2.1399998E-01	+1.2999999E-01	+1.7624735E-01
61.0	40	+1.7277705E-01	+2.3499183E-02	+2.1999996E-01	+1.0999995E-01	+1.7645639E-01
62.0	35	+1.8795377E-01	+2.6520363E-02	+2.3179996E-01	+1.0999995E-01	+1.7666536E-01
63.0	45	+1.8076401E-01	+2.7297793E-02	+2.3879998E-01	+1.3119995E-01	+1.7687439E-01
64.0	36	+1.8054950E-01	+1.7006843E-02	+2.1099996E-01	+1.4319998E-01	+1.7708337E-01
65.0	28	+1.9099160E-01	+2.5278450E-02	+2.5000000E-01	+1.5399998E-01	+1.7729234E-01
66.0	28	+1.7329245E-01	+2.8545798E-02	+2.3599994E-01	+1.2999999E-01	+1.7750138E-01
67.0	46	+1.6215610E-01	+3.0029779E-02	+2.1999996E-01	+1.0799998E-01	+1.7771035E-01
68.0	44	+1.7907917E-01	+3.1261405E-02	+2.5999999E-01	+1.1099994E-01	+1.7791932E-01
69.0	32	+1.8545579E-01	+1.5569560E-02	+2.2399997E-01	+1.5799999E-01	+1.7812836E-01
70.0	40	+1.8121451E-01	+2.1388523E-02	+2.6199996E-01	+1.2199997E-01	+1.7833733E-01
71.0	47	+1.8080592E-01	+2.6908443E-02	+2.5399994E-01	+1.0599994E-01	+1.7854630E-01
72.0	34	+1.7831426E-01	+1.7676768E-02	+2.0719999E-01	+1.4329999E-01	+1.7875534E-01

AND 3066 PROPELLANT(AND) TENSILE STN AT RUPT, .0002 IN/MIN, 77 DEG F, UNLND CTNS

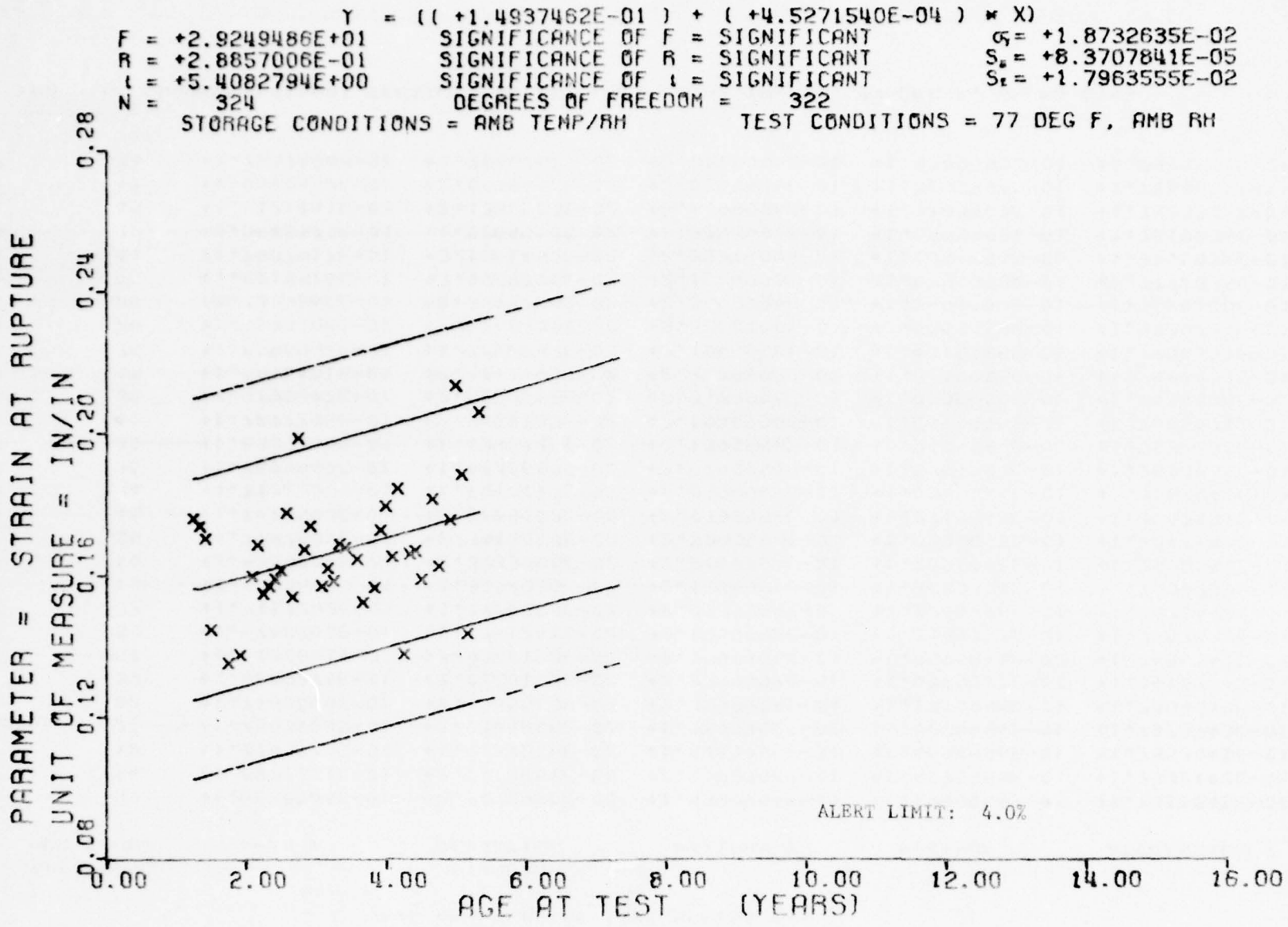

Y = ((+1.4937462E-01) + (+4.5271540E-04) * X)
F = +2.9249486E+01 SIGNIFICANCE OF F = SIGNIFICANT σ = +1.8732635E-02
R = +2.8857006E-01 SIGNIFICANCE OF R = SIGNIFICANT S_a = +8.3707841E-05
t = +5.4082794E+00 SIGNIFICANCE OF t = SIGNIFICANT S_t = +1.7963555E-02
N = 324 DEGREES OF FREEDOM = 322
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = 77 DEG F, AMB RH
PARAMETER = STRAIN AT RUPTURE
UNIT OF MEASURE = IN/IN
0.08
0.12
0.16
0.20
0.24
0.28
ALERT LIMIT: 4.0%
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
ANB 3066 PROPELLANT(ANT) TENSILE STN AT RUPT, 0.0002 IN/MIN, 77 DEG F, UNLND CTN

Figure 4-5

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
15.0	1	+1.7639994E-01	+0.0000000E+71	+1.7639994E-01	+1.7639994E-01	+1.5616530E-01
16.0	3	+1.7419993E-01	+8.5453358E-03	+1.8419998E-01	+1.6739994E-01	+1.5661805E-01
17.0	2	+1.7069995E-01	+2.1281275E-03	+1.7219996E-01	+1.6919994E-01	+1.5707075E-01
18.0	3	+1.4596661E-01	+1.9038460E-02	+1.6639995E-01	+1.2959998E-01	+1.5752345E-01
21.0	3	+1.3546663E-01	+2.8113705E-03	+1.3839995E-01	+1.3279998E-01	+1.5888160E-01
23.0	3	+1.3786661E-01	+3.2349407E-03	+1.4079999E-01	+1.3439995E-01	+1.5978705E-01
25.0	3	+1.5999996E-01	+9.4273241E-03	+1.6799998E-01	+1.5119999E-01	+1.6069245E-01
26.0	17	+1.6892913E-01	+1.1318348E-02	+1.8319994E-01	+1.3799995E-01	+1.6114521E-01
27.0	33	+1.5507841E-01	+1.1200248E-02	+1.7439997E-01	+1.3199996E-01	+1.6159790E-01
28.0	22	+1.5709960E-01	+7.6840243E-03	+1.7799997E-01	+1.4039999E-01	+1.6205060E-01
29.0	8	+1.5924990E-01	+7.3804571E-03	+1.7399996E-01	+1.5039998E-01	+1.6250336E-01
30.0	15	+1.6165298E-01	+1.4151503E-02	+1.8799996E-01	+1.4559996E-01	+1.6295605E-01
31.0	30	+1.7796283E-01	+2.2530510E-02	+2.3449999E-01	+1.4479994E-01	+1.6340875E-01
32.0	22	+1.5429961E-01	+1.1200986E-02	+1.7279994E-01	+1.3079994E-01	+1.6386151E-01
33.0	5	+1.5893997E-01	+8.5961213E-03	+2.0959997E-01	+1.8569999E-01	+1.6431421E-01
34.0	15	+1.6763287E-01	+2.3727652E-02	+1.9769996E-01	+1.1679995E-01	+1.6476690E-01
35.0	11	+1.7419064E-01	+1.4494093E-02	+1.9559997E-01	+1.4639997E-01	+1.6521966E-01
37.0	4	+1.5734994E-01	+8.1139909E-03	+1.6679996E-01	+1.4699995E-01	+1.6612505E-01
38.0	3	+1.6239994E-01	+7.7140833E-03	+1.6799998E-01	+1.5359997E-01	+1.6657775E-01
39.0	3	+1.5879994E-01	+4.8498249E-03	+1.6319996E-01	+1.5359997E-01	+1.6703051E-01
40.0	1	+1.6919994E-01	+0.0000000E+51	+1.6919994E-01	+1.6919994E-01	+1.6748321E-01
41.0	8	+1.6814994E-01	+1.2580298E-02	+1.8719995E-01	+1.5119999E-01	+1.6793590E-01
43.0	3	+1.6479992E-01	+4.9952952E-03	+1.6879999E-01	+1.5919995E-01	+1.6884136E-01
44.0	4	+1.5269994E-01	+1.0420758E-02	+1.6259998E-01	+1.4339995E-01	+1.6929405E-01
46.0	6	+1.5693330E-01	+6.3065560E-03	+1.6799998E-01	+1.5119999E-01	+1.7019951E-01
47.0	10	+1.7309969E-01	+1.3812203E-02	+1.9079995E-01	+1.5479999E-01	+1.7065221E-01
48.0	6	+1.7991650E-01	+6.7499202E-03	+1.9099998E-01	+1.7299997E-01	+1.7110490E-01
49.0	5	+1.6563993E-01	+9.9680939E-03	+1.7839998E-01	+1.5359997E-01	+1.7155760E-01
50.0	9	+1.8478870E-01	+6.1775400E-03	+1.9839996E-01	+1.7679998E-01	+1.7201036E-01
51.0	3	+1.3816660E-01	+1.9619874E-03	+1.3999998E-01	+1.3609999E-01	+1.7246305E-01
52.0	3	+1.6643327E-01	+6.7678624E-03	+1.7419999E-01	+1.6179996E-01	+1.7291581E-01

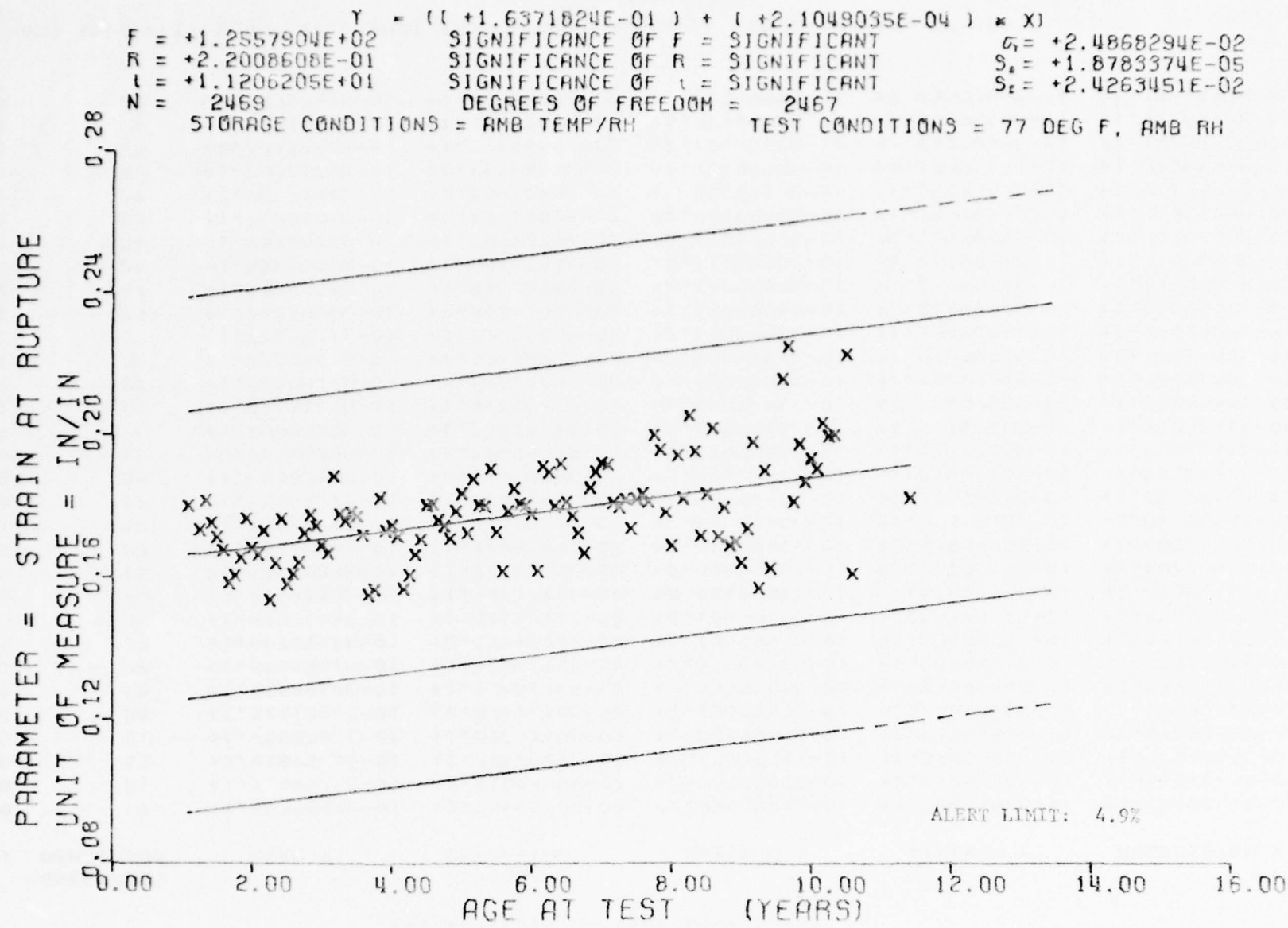
ANB 3066 PROPELLANT(ANT) TENSILE SIN AT RUPT, 0.0002 IN/MIN, 77 DEG F, UNLND CTN

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
53.0	17	+1.6729372E-01	+1.9295611E-02	+2.0059996E-01	+1.3219994E-01	+1.7336851E-01
54.0	7	+1.5915703E-01	+1.4255771E-02	+1.8239998E-01	+1.4169996E-01	+1.7382121E-01
56.0	9	+1.8178862E-01	+1.5980404E-02	+2.0089995E-01	+1.5229994E-01	+1.7472666E-01
57.0	9	+1.6276645E-01	+6.5242667E-03	+1.7069995E-01	+1.5319997E-01	+1.7517936E-01
59.0	3	+1.7586660E-01	+1.1997678E-02	+1.8909996E-01	+1.6569995E-01	+1.7608481E-01
60.0	3	+2.1369993E-01	+6.2859281E-03	+2.1929997E-01	+2.0689994E-01	+1.7653751E-01
61.0	3	+1.8866664E-01	+4.3153917E-03	+1.9349998E-01	+1.8519997E-01	+1.7699021E-01
62.0	3	+1.4403331E-01	+5.2173601E-03	+1.4789998E-01	+1.3809996E-01	+1.7744296E-01
64.0	6	+2.0608311E-01	+1.4957927E-02	+2.1839994E-01	+1.7719995E-01	+1.7834836E-01

ANR 3066 PROPELLANT(ANT) TENSILE STN AT RUPT, 0.0002 IN/MIN, 77 DEG F, UNLND CTN



ANB 3066 PROPELLANT (ALL ANB) TENS STN AT RUPTURE, .0002 IN/MIN, 77 DEG F

Figure 4-6

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
13.0	7	+1.8035697E-01	+1.0419620E-02	+1.9399994E-01	+1.6829997E-01	+1.6645461E-01
15.0	21	+1.7357575E-01	+1.9192339E-02	+2.0599997E-01	+1.4129996E-01	+1.6687560E-01
16.0	45	+1.8187510E-01	+2.2932069E-02	+2.2399997E-01	+1.3299995E-01	+1.6708606E-01
17.0	21	+1.7558062E-01	+1.8789349E-02	+2.0879995E-01	+1.4099997E-01	+1.6729652E-01
18.0	28	+1.7161029E-01	+2.2749496E-02	+2.1869999E-01	+1.2689995E-01	+1.6750705E-01
19.0	18	+1.6789960E-01	+2.2326174E-02	+2.0339995E-01	+1.3329994E-01	+1.6771751E-01
20.0	27	+1.5859591E-01	+2.1734157E-02	+2.0599997E-01	+1.2559998E-01	+1.6792804E-01
21.0	37	+1.6072118E-01	+2.2879600E-02	+2.0799994E-01	+1.2399995E-01	+1.6813850E-01
22.0	35	+1.6577678E-01	+2.0664273E-02	+2.1099996E-01	+1.2479996E-01	+1.6834902E-01
23.0	19	+1.7694163E-01	+1.7451774E-02	+2.0849996E-01	+1.5299999E-01	+1.6855949E-01
24.0	15	+1.6870629E-01	+1.7220843E-02	+2.0289999E-01	+1.4199995E-01	+1.6877001E-01
25.0	33	+1.6670566E-01	+1.7064729E-02	+2.0199996E-01	+1.4399999E-01	+1.6898047E-01
26.0	27	+1.7354774E-01	+1.9385037E-02	+2.1999996E-01	+1.4239996E-01	+1.6919094E-01
27.0	22	+1.5385407E-01	+1.8593140E-02	+1.9889998E-01	+1.2399995E-01	+1.6940146E-01
28.0	36	+1.6433292E-01	+2.1435593E-02	+2.0999997E-01	+1.2799996E-01	+1.6961193E-01
29.0	12	+1.7676639E-01	+1.5399011E-02	+1.9799995E-01	+1.5199995E-01	+1.6982245E-01
30.0	16	+1.5833097E-01	+1.8035537E-02	+1.8399995E-01	+1.3199996E-01	+1.7003291E-01
31.0	13	+1.6116124E-01	+1.4255979E-02	+1.9399994E-01	+1.3999998E-01	+1.7024344E-01
32.0	27	+1.6450697E-01	+1.8066485E-02	+1.9599997E-01	+1.3079994E-01	+1.7045390E-01
33.0	39	+1.7269957E-01	+1.4258270E-02	+2.0869994E-01	+1.4799994E-01	+1.7066442E-01
34.0	17	+1.7789971E-01	+1.8221263E-02	+2.1199995E-01	+1.5999995E-01	+1.7087489E-01
35.0	23	+1.7479526E-01	+2.1130133E-02	+2.0799994E-01	+1.2619996E-01	+1.7108535E-01
36.0	47	+1.6938894E-01	+1.9420894E-02	+2.1409994E-01	+1.2799996E-01	+1.7129588E-01
37.0	26	+1.6708803E-01	+1.9481163E-02	+2.1199995E-01	+1.2999999E-01	+1.7150634E-01
38.0	34	+1.8872010E-01	+1.7097072E-02	+2.1799999E-01	+1.5699994E-01	+1.7171686E-01
39.0	12	+1.7808306E-01	+2.4213908E-02	+2.0499998E-01	+1.2799996E-01	+1.7192733E-01
40.0	27	+1.7613297E-01	+3.8344596E-02	+3.0599999E-01	+1.1799997E-01	+1.7213785E-01
41.0	22	+1.7872679E-01	+1.6888693E-02	+1.9799995E-01	+1.4799994E-01	+1.7234832E-01
42.0	20	+1.7748463E-01	+1.5714440E-02	+2.1069997E-01	+1.5199995E-01	+1.7255878E-01
43.0	9	+1.7231088E-01	+1.2659257E-02	+1.9299995E-01	+1.5119999E-01	+1.7276930E-01
44.0	25	+1.5532362E-01	+1.9235538E-02	+1.9679999E-01	+1.1399996E-01	+1.7297977E-01

ANB 3066 PROPELLANT (ALL ANB) TENS STN AT RUPTURE, .0002 IN/MIN, 77 DEG F

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
45.0	20	+1.5686964E-01	+2.2092980E-02	+1.9399994E-01	+1.1999994E-01	+1.7319029E-01
46.0	44	+1.8271321E-01	+2.1218051E-02	+2.3599994E-01	+1.4199995E-01	+1.7340075E-01
47.0	12	+1.7349970E-01	+1.7237205E-02	+1.9769996E-01	+1.4599996E-01	+1.7361128E-01
48.0	20	+1.7503958E-01	+2.0194668E-02	+1.9699996E-01	+1.1279994E-01	+1.7382174E-01
49.0	22	+1.7188596E-01	+2.4555513E-02	+2.3999994E-01	+1.1399996E-01	+1.7403227E-01
50.0	32	+1.5710586E-01	+2.9698195E-02	+2.2399997E-01	+1.0399997E-01	+1.7424273E-01
51.0	57	+1.6100651E-01	+3.0070103E-02	+2.1999996E-01	+9.9999964E-02	+1.7445319E-01
52.0	51	+1.6675245E-01	+1.8250804E-02	+2.1959996E-01	+1.2199997E-01	+1.7466372E-01
53.0	40	+1.7110705E-01	+1.7563350E-02	+2.0039999E-01	+1.3269996E-01	+1.7487418E-01
54.0	19	+1.8073648E-01	+2.3754936E-02	+2.1599996E-01	+1.3689994E-01	+1.7508471E-01
55.0	48	+1.8097877E-01	+2.4177954E-02	+2.2199994E-01	+1.2399995E-01	+1.7529517E-01
56.0	62	+1.7648178E-01	+2.3690128E-02	+2.3299998E-01	+1.0999995E-01	+1.7550569E-01
57.0	46	+1.7475599E-01	+2.0609052E-02	+2.0799994E-01	+1.2719994E-01	+1.7571616E-01
58.0	34	+1.7132306E-01	+1.7440113E-02	+2.0999997E-01	+1.2799996E-01	+1.7592668E-01
59.0	20	+1.7899960E-01	+1.6830866E-02	+2.0799994E-01	+1.5799999E-01	+1.7613714E-01
60.0	20	+1.8389958E-01	+1.6396725E-02	+2.1399998E-01	+1.2999999E-01	+1.7634761E-01
61.0	40	+1.7277705E-01	+2.3499183E-02	+2.1999996E-01	+1.0999995E-01	+1.7655813E-01
62.0	35	+1.8795377E-01	+2.6520363E-02	+2.3179996E-01	+1.0999995E-01	+1.7676860E-01
63.0	45	+1.8076401E-01	+2.7297793E-02	+2.3879998E-01	+1.3119995E-01	+1.7697912E-01
64.0	36	+1.8054950E-01	+1.7006843E-02	+2.1099996E-01	+1.4319998E-01	+1.7718958E-01
65.0	28	+1.9098168E-01	+2.5278450E-02	+2.5000000E-01	+1.5399998E-01	+1.7740011E-01
66.0	28	+1.7329245E-01	+2.8645798E-02	+2.3599994E-01	+1.2999999E-01	+1.7761057E-01
67.0	46	+1.6215610E-01	+3.0929775E-02	+2.1999996E-01	+1.0799998E-01	+1.7782109E-01
68.0	44	+1.7907917E-01	+3.1261405E-02	+2.5999999E-01	+1.1999994E-01	+1.7803156E-01
69.0	32	+1.8545579E-01	+1.5569560E-02	+2.2399997E-01	+1.5799999E-01	+1.7824202E-01
70.0	40	+1.8121451E-01	+2.1388523E-02	+2.6199996E-01	+1.2199997E-01	+1.7845255E-01
71.0	47	+1.8080592E-01	+2.6508443E-02	+2.5399994E-01	+1.0599994E-01	+1.7866301E-01
72.0	34	+1.7831426E-01	+1.7676768E-02	+2.0719999E-01	+1.4329999E-01	+1.7887353E-01
73.0	27	+1.6233658E-01	+1.5547724E-02	+1.9199997E-01	+1.1399996E-01	+1.7908400E-01
74.0	15	+1.9179958E-01	+1.2638456E-02	+2.0699995E-01	+1.6799998E-01	+1.7929452E-01
75.0	30	+1.9006609E-01	+1.7608359E-02	+2.2199994E-01	+1.3999998E-01	+1.7950499E-01

ANB 3066 PROPELLANT (ALL ANB) TENS STN AT RUPTURE, .0002 IN/MIN, 77 DEG F

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
76.0	17	+1.8052309E-01	+9.9617969E-03	+2.0299994E-01	+1.5999996E-01	+1.7971551E-01
77.0	19	+1.9249957E-01	+2.1582643E-02	+2.4599999E-01	+1.6599994E-01	+1.7992597E-01
78.0	25	+1.8172764E-01	+2.3672027E-02	+2.3299998E-01	+1.3679999E-01	+1.8013644E-01
79.0	17	+1.7781144E-01	+2.3929570E-02	+2.2299998E-01	+1.2999999E-01	+1.8034696E-01
80.0	33	+1.7295718E-01	+2.1078770E-02	+2.1599996E-01	+1.2189996E-01	+1.8055742E-01
81.0	26	+1.6733801E-01	+2.3071100E-02	+2.1599996E-01	+1.1099994E-01	+1.8076795E-01
82.0	15	+1.8572634E-01	+1.9294208E-02	+2.2799998E-01	+1.6199994E-01	+1.8097841E-01
83.0	33	+1.9016617E-01	+2.0164813E-02	+2.3999994E-01	+1.6159999E-01	+1.8118894E-01
84.0	42	+1.9268763E-01	+2.2424166E-02	+2.5089997E-01	+1.4959996E-01	+1.8139940E-01
85.0	15	+1.9227951E-01	+1.6881057E-02	+2.0999997E-01	+1.4599996E-01	+1.8160986E-01
86.0	22	+1.8153142E-01	+1.4031415E-02	+2.0519995E-01	+1.4799994E-01	+1.8182039E-01
87.0	23	+1.8033862E-01	+3.5971556E-02	+2.6999998E-01	+1.1279994E-01	+1.8203085E-01
88.0	32	+1.8260890E-01	+3.2464416E-02	+2.6699995E-01	+8.5199952E-02	+1.8224138E-01
89.0	31	+1.7433512E-01	+1.8532494E-02	+2.3039996E-01	+1.2699997E-01	+1.8245184E-01
90.0	11	+1.8250876E-01	+2.3136175E-02	+2.1299999E-01	+1.4999997E-01	+1.8266236E-01
91.0	9	+1.8409979E-01	+1.4428929E-02	+2.1119999E-01	+1.6559994E-01	+1.8287283E-01
92.0	17	+1.8181139E-01	+1.1530091E-02	+1.9799995E-01	+1.4959996E-01	+1.8308335E-01
93.0	15	+2.0067954E-01	+2.9362383E-02	+2.8319996E-01	+1.6799998E-01	+1.8329381E-01
94.0	13	+1.9653040E-01	+2.0113837E-02	+2.2799998E-01	+1.5299999E-01	+1.8350428E-01
95.0	24	+1.7888295E-01	+2.1097116E-02	+2.1519994E-01	+1.4039999E-01	+1.8371480E-01
96.0	11	+1.6947239E-01	+2.2666155E-02	+2.1299999E-01	+1.3439995E-01	+1.8392527E-01
97.0	6	+1.9493323E-01	+1.3899310E-02	+2.1399998E-01	+1.7999994E-01	+1.8413579E-01
98.0	9	+1.8269968E-01	+2.1618974E-02	+2.1119999E-01	+1.6159999E-01	+1.8434625E-01
99.0	5	+2.0611989E-01	+2.8845961E-02	+2.4159997E-01	+1.6899996E-01	+1.8455678E-01
100.0	2	+1.9599997E-01	+5.2326007E-02	+2.3299998E-01	+1.5899997E-01	+1.8476724E-01
101.0	11	+1.7219066E-01	+1.9016205E-02	+2.0239996E-01	+1.3999998E-01	+1.8497776E-01
102.0	3	+1.8393325E-01	+8.7957784E-03	+1.9359999E-01	+1.7639994E-01	+1.8518823E-01
103.0	2	+2.0249992E-01	+1.9091691E-02	+2.1599996E-01	+1.8899995E-01	+1.8539869E-01
104.0	7	+1.7202836E-01	+4.1338857E-03	+1.7669999E-01	+1.6559994E-01	+1.8560922E-01
105.0	9	+1.8013304E-01	+2.7896107E-02	+2.2199994E-01	+1.3679999E-01	+1.8581968E-01
106.0	11	+1.6949063E-01	+5.1342709E-02	+2.5269997E-01	+9.3299984E-02	+1.8603020E-01

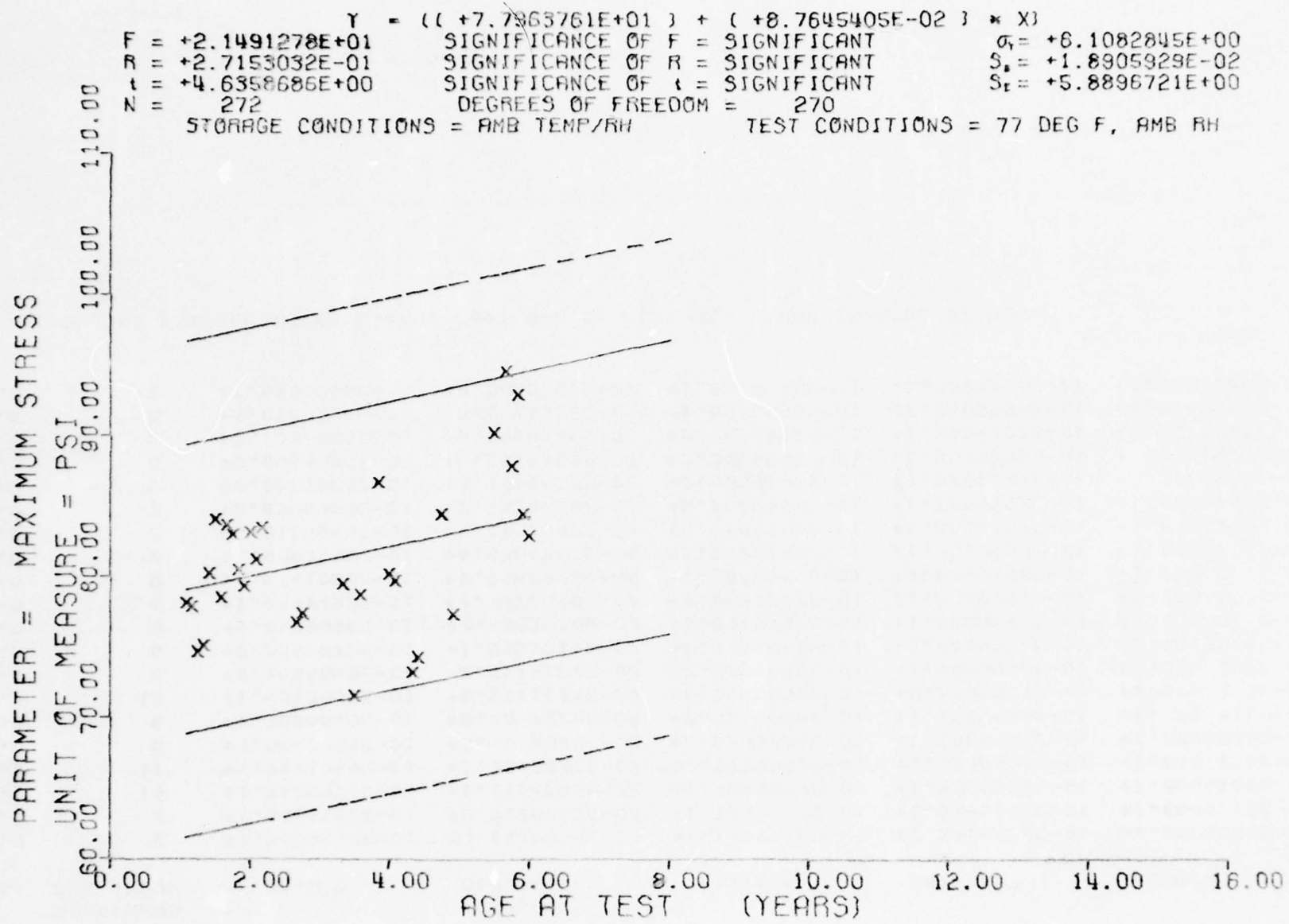
ANB 3066 PROPELLANT (ALL ANB) TENS STN AT RUPTURE, .0002 IN/MIN, 77 DEG F

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
107.0	2	+1.7059993E-01	+4.8100599E-03	+1.7399996E-01	+1.6719996E-01	+1.8624067E-01
108.0	3	+1.6469997E-01	+9.9225311E-03	+1.7609995E-01	+1.5799999E-01	+1.8645119E-01
109.0	14	+1.7429971E-01	+1.0564565E-02	+1.9599997E-01	+1.5999996E-01	+1.8666166E-01
110.0	11	+1.9871789E-01	+3.2342236E-02	+2.5779998E-01	+1.6239994E-01	+1.8687218E-01
111.0	5	+1.5747994E-01	+4.1513829E-02	+2.2299998E-01	+1.1069995E-01	+1.8708264E-01
112.0	6	+1.9066649E-01	+5.4617228E-02	+2.5219994E-01	+1.1819994E-01	+1.8729311E-01
113.0	18	+1.6313850E-01	+4.2041126E-02	+2.5099998E-01	+9.1999957E-02	+1.8750363E-01
115.0	6	+2.1636658E-01	+2.9278187E-02	+2.5999999E-01	+1.9029998E-01	+1.8792462E-01
116.0	6	+2.2569972E-01	+1.5951211E-02	+2.4799996E-01	+2.0439994E-01	+1.8813508E-01
117.0	3	+1.8179994E-01	+3.9222634E-03	+1.8449997E-01	+1.7729997E-01	+1.8834561E-01
118.0	4	+1.9807493E-01	+1.2276390E-02	+2.0889997E-01	+1.8089997E-01	+1.8855607E-01
119.0	9	+1.8741083E-01	+9.7280928E-03	+1.9849997E-01	+1.6799998E-01	+1.8876659E-01
120.0	2	+1.9394999E-01	+4.4369543E-04	+1.9429999E-01	+1.9359999E-01	+1.8897706E-01
121.0	3	+1.9119995E-01	+5.1882549E-03	+1.9699996E-01	+1.8699997E-01	+1.8918752E-01
122.0	3	+2.0399993E-01	+2.9430655E-02	+2.3629999E-01	+1.7869997E-01	+1.8939805E-01
123.0	9	+2.0031088E-01	+3.1968413E-02	+2.5359994E-01	+1.6199994E-01	+1.8960851E-01
124.0	6	+2.0064973E-01	+2.7934156E-02	+2.3499995E-01	+1.5599995E-01	+1.8981903E-01
126.0	6	+2.2331649E-01	+5.0069649E-02	+2.8899997E-01	+1.5469998E-01	+1.9024002E-01
127.0	3	+1.6163331E-01	+3.0679355E-02	+1.8419998E-01	+1.2669998E-01	+1.9045048E-01
137.0	1	+1.8299996E-01	+0.0000000E+27	+1.8299996E-01	+1.8299996E-01	+1.9255536E-01

ANB 3066 PROPELLANT (ALL ANB) TENS STN AT RUPTURE, .0002 IN/MIN, 77 DEG F



ANB 3066 PROPELLANT (ANA), TENSILE MAX STRESS, .0002 IN/MIN, 77 DEG F, UNLND CTN

Figure 4-7

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
13.0	5	+7.8139938E+01	+3.0443391E+00	+8.2695556E+01	+7.4395553E+01	+7.5103149E+01
14.0	16	+7.7899948E+01	+3.1051746E+00	+8.2599990E+01	+7.2695556E+01	+7.5190755E+01
15.0	14	+7.4685607E+01	+3.4370305E+00	+8.1199996E+01	+6.9239557E+01	+7.5278442E+01
16.0	5	+7.5159957E+01	+3.2683476E+00	+7.9199996E+01	+7.0199556E+01	+7.5366073E+01
17.0	10	+8.0269943E+01	+5.1623995E+00	+8.8139996E+01	+7.4755557E+01	+7.5453720E+01
18.0	15	+8.4119918E+01	+3.8621899E+00	+9.2899993E+01	+7.7199996E+01	+7.5541368E+01
19.0	13	+7.8546096E+01	+6.3249474E+00	+9.1599990E+01	+7.1199555E+01	+7.5629013E+01
20.0	13	+8.3733245E+01	+5.1463979E+00	+9.2399993E+01	+7.5000000E+01	+7.5716659E+01
21.0	15	+8.3039901E+01	+5.6716507E+00	+9.2599990E+01	+7.3699556E+01	+7.5804306E+01
22.0	14	+8.0528503E+01	+5.0799171E+00	+9.1199996E+01	+7.2199556E+01	+7.5891952E+01
23.0	10	+7.9339904E+01	+3.6055262E+00	+8.7899993E+01	+7.5199956E+01	+7.5979599E+01
24.0	10	+8.3189941E+01	+6.0060061E+00	+8.9299987E+01	+6.8899993E+01	+8.0067245E+01
25.0	15	+8.1226593E+01	+3.9112141E+00	+9.0000000E+01	+7.6399993E+01	+8.0154892E+01
26.0	15	+8.3493240E+01	+3.8780009E+00	+9.1000000E+01	+7.6599950E+01	+8.0242538E+01
32.0	5	+7.6779922E+01	+3.9791757E+00	+8.1000000E+01	+7.0299557E+01	+8.0768406E+01
33.0	5	+7.7419967E+01	+2.4452230E+00	+8.0399993E+01	+7.3899993E+01	+8.0856052E+01
40.0	5	+7.9505950E+01	+1.5409702E+00	+8.0769989E+01	+7.7250000E+01	+8.1469879E+01
42.0	5	+7.1579925E+01	+3.8764027E+00	+7.8649993E+01	+6.6619555E+01	+8.1644526E+01
43.0	5	+7.8759948E+01	+1.2004833E+00	+8.0159988E+01	+7.7379989E+01	+8.1732313E+01
46.0	5	+8.6717864E+01	+5.7664520E-01	+8.7955997E+01	+8.6239990E+01	+8.1995437E+01
48.0	3	+8.0226654E+01	+4.2191657E+00	+8.3079986E+01	+7.5379989E+01	+8.2170730E+01
49.0	7	+7.9714202E+01	+1.3715568E+00	+8.0679989E+01	+7.7459991E+01	+8.2258377E+01
52.0	8	+7.3221191E+01	+2.8677899E+00	+7.6729995E+01	+6.9839996E+01	+8.2521316E+01
53.0	11	+7.4310806E+01	+2.8511881E+00	+7.9119995E+01	+7.0629989E+01	+8.2608963E+01
57.0	3	+8.4439987E+01	+8.4981377E-01	+8.5299987E+01	+8.3599990E+01	+8.2959630E+01
59.0	5	+7.7349945E+01	+1.1144771E+00	+7.8500000E+01	+7.5869995E+01	+8.3134276E+01
66.0	3	+8.0196609E+01	+1.0900035E+00	+9.0929992E+01	+8.8949996E+01	+8.3748952E+01
68.0	3	+8.4566578E+01	+1.0548824E+00	+8.5639993E+01	+8.3469985E+01	+8.3923645E+01
69.0	9	+8.7852127E+01	+4.4664500E+00	+9.4549987E+01	+8.0199956E+01	+8.4011291E+01
70.0	8	+8.2536157E+01	+2.0646839E+00	+8.6379989E+01	+8.0099950E+01	+8.4098937E+01
71.0	10	+8.4438888E+01	+7.0187119E+00	+8.5329986E+01	+7.4579986E+01	+8.4186584E+01

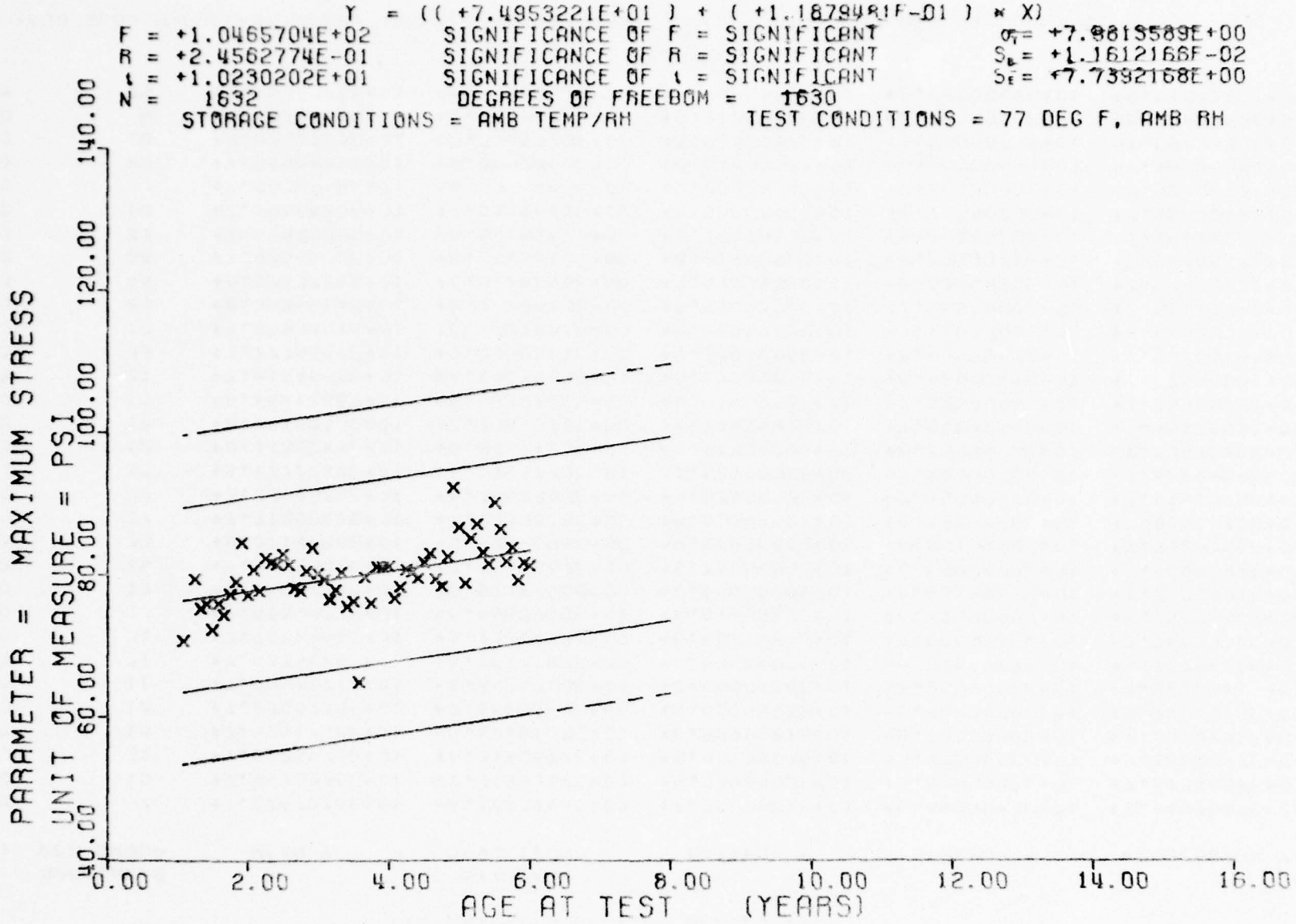
ANB 3066 PROPELLANT(ANA), TENSILE MAX STRESS, .0002 IN/MIN, 77 DEG F, UNLND CTN

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
72.0	3	+8.2509988E+01	+1.4826656E+00	+8.4179992E+01	+8.1279998E+01	+8.4274215E+01

ANB 3066 PROPELLANT(ANA), TENSILE MAX STRESS, .0002 IN/MIN, 77 DEG F, UNLND CTN



ANB 3066 PROPELLANT(ANB) TENSILE MAX STRESS, .0002 IN/MIN, 77 DEG F, UNLND CTNS

Figure 4-8

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
13.0	7	+7.0747070E+01	+4.1623044E+00	+7.7299987E+01	+6.6439987E+01	+7.6497543E+01
15.0	15	+7.9473236E+01	+7.2095352E+00	+9.0399993E+01	+6.6299987E+01	+7.6735137E+01
16.0	30	+7.5225570E+01	+8.3120671E+00	+8.9899993E+01	+5.4250000E+01	+7.6853927E+01
17.0	15	+7.5951232E+01	+8.8055137E+00	+8.8299987E+01	+5.9500000E+01	+7.6972732E+01
18.0	12	+7.2300735E+01	+7.0548569E+00	+8.6399993E+01	+5.9099990E+01	+7.7091522E+01
19.0	11	+7.5997177E+01	+2.8974313E+00	+7.9500000E+01	+7.2599990E+01	+7.7210311E+01
20.0	21	+7.4375625E+01	+6.1556707E+00	+8.5349990E+01	+6.2049987E+01	+7.7329116E+01
21.0	31	+7.7272781E+01	+4.2121273E+00	+8.4519989E+01	+7.0769989E+01	+7.7447906E+01
22.0	23	+7.9059875E+01	+6.4963950E+00	+9.0799987E+01	+6.7099990E+01	+7.7566696E+01
23.0	10	+8.4555923E+01	+5.9137795E+00	+9.1099990E+01	+7.4319992E+01	+7.7685501E+01
24.0	15	+7.7172607E+01	+7.1984867E+00	+8.7699996E+01	+6.6000000E+01	+7.7804290E+01
25.0	33	+8.0718638E+01	+5.8762098E+00	+9.1000000E+01	+6.8919998E+01	+7.7923080E+01
26.0	27	+7.7725845E+01	+7.0738828E+00	+9.0389999E+01	+6.7829986E+01	+7.8041885E+01
27.0	22	+8.2398529E+01	+6.2963343E+00	+9.5399993E+01	+7.4599990E+01	+7.8160675E+01
28.0	30	+8.1772247E+01	+1.0793779E+01	+1.0629998E+02	+4.4699996E+01	+7.8279464E+01
29.0	12	+8.1480743E+01	+5.8047124E+00	+8.9000000E+01	+6.7899993E+01	+7.8398269E+01
30.0	10	+8.2972946E+01	+3.3451370E+00	+8.7799987E+01	+7.8489990E+01	+7.8517059E+01
31.0	13	+8.1445266E+01	+4.5739158E+00	+9.0399993E+01	+7.6259994E+01	+7.8635848E+01
32.0	21	+7.8154663E+01	+4.6407963E+00	+8.6799987E+01	+6.9299987E+01	+7.8754653E+01
33.0	33	+7.7770507E+01	+9.9269201E+00	+9.3500000E+01	+5.8799987E+01	+7.8873443E+01
34.0	17	+8.0553341E+01	+6.3257201E+00	+9.0899993E+01	+7.1500000E+01	+7.8992233E+01
35.0	20	+8.3836914E+01	+3.7613813E+00	+9.1500000E+01	+7.5599990E+01	+7.9111038E+01
36.0	44	+8.0243774E+01	+6.3484296E+00	+9.6799987E+01	+6.6329986E+01	+7.9229827E+01
37.0	26	+7.9354522E+01	+6.9715818E+00	+8.9199996E+01	+6.6299987E+01	+7.9348617E+01
38.0	33	+7.6569595E+01	+6.5018167E+00	+8.7399993E+01	+6.4000000E+01	+7.9467422E+01
39.0	12	+7.7916625E+01	+1.0132610E+01	+9.5000000E+01	+6.7000000E+01	+7.9586212E+01
40.0	27	+8.0336944E+01	+6.5774463E+00	+9.2000000E+01	+7.1000000E+01	+7.9705001E+01
41.0	22	+7.5490829E+01	+6.0693368E+00	+8.5799987E+01	+6.6500000E+01	+7.9823806E+01
42.0	20	+7.6303405E+01	+5.6731970E+00	+8.8549987E+01	+6.8000000E+01	+7.9942596E+01
43.0	9	+6.4928817E+01	+1.4048470E+01	+9.2239990E+01	+5.0599990E+01	+8.0061386E+01
44.0	25	+7.9696304E+01	+6.4566581E+00	+8.9389999E+01	+6.1500000E+01	+8.0180191E+01

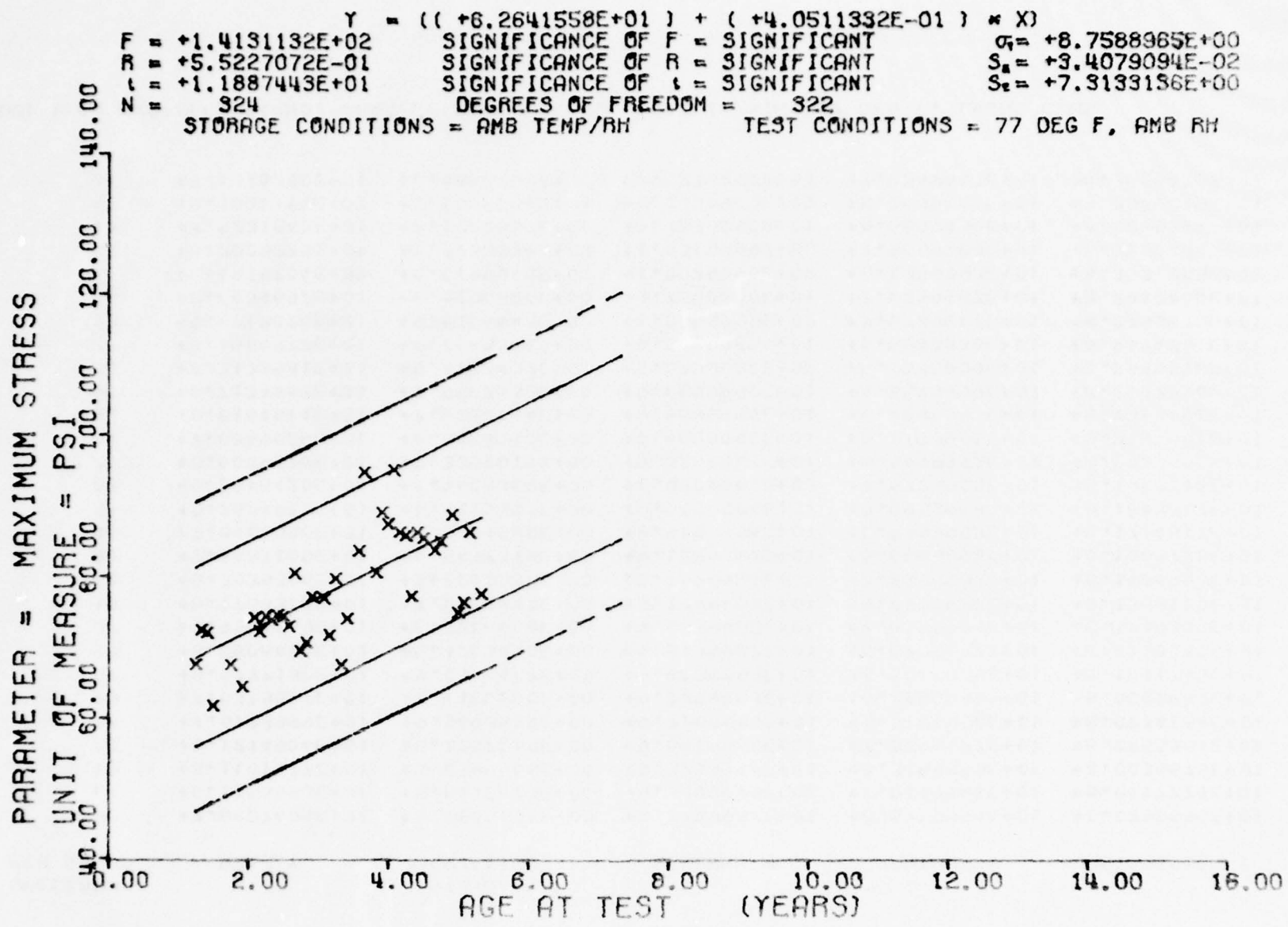
ANB 3066 PROPELLANT(ANB) TENSILE MAX STRESS, .0002 IN/MIN, 77 DEG F, UNLND CTNS

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
45.0	20	+7.6027404E+01	+5.7585151E+00	+8.3799987E+01	+6.5759994E+01	+8.0298980E+01
46.0	44	+8.1155593E+01	+5.6697673E+00	+9.3399993E+01	+7.0199996E+01	+8.0417770E+01
47.0	12	+8.1101577E+01	+6.8396346E+00	+9.3259994E+01	+7.3199996E+01	+8.0536575E+01
48.0	20	+8.1214904E+01	+6.1387259E+00	+9.5419998E+01	+7.3299987E+01	+8.0655364E+01
49.0	22	+7.6723999E+01	+9.0693504E+00	+9.7269989E+01	+6.3199996E+01	+8.0774154E+01
50.0	29	+7.8318527E+01	+7.7125550E+00	+9.2399993E+01	+6.2899993E+01	+8.0892959E+01
51.0	57	+8.0777130E+01	+7.0749497E+00	+9.6039993E+01	+6.5019989E+01	+8.1011749E+01
52.0	50	+8.0506484E+01	+5.1203490E+00	+9.5799987E+01	+6.5799987E+01	+8.1130538E+01
53.0	37	+7.9544769E+01	+6.5216908E+00	+9.5039993E+01	+7.0159988E+01	+8.1249343E+01
54.0	19	+8.1768310E+01	+7.6525664E+00	+9.1799987E+01	+5.8799987E+01	+8.1368133E+01
55.0	42	+8.3036346E+01	+5.8206339E+00	+9.7699996E+01	+7.2299987E+01	+8.1486923E+01
56.0	59	+7.9427169E+01	+4.5997379E+00	+9.1399993E+01	+6.6669998E+01	+8.1605728E+01
57.0	46	+7.8460556E+01	+6.5721580E+00	+8.9699996E+01	+6.9399993E+01	+8.1724517E+01
58.0	34	+8.2624023E+01	+6.8119651E+00	+9.5000000E+01	+7.0999988E+01	+8.1843307E+01
59.0	20	+9.2346420E+01	+6.7405369E+00	+1.0300000E+02	+7.6729955E+01	+8.1962112E+01
60.0	20	+8.6679870E+01	+7.3399614E+00	+9.3299987E+01	+6.0899993E+01	+8.2080902E+01
61.0	40	+7.8849624E+01	+8.6278910E+00	+9.4000000E+01	+6.1199996E+01	+8.2199691E+01
62.0	35	+8.5151611E+01	+7.8220164E+00	+9.5599990E+01	+6.4899993E+01	+8.2318496E+01
63.0	45	+8.7134567E+01	+7.9507533E+00	+9.8599990E+01	+6.5599990E+01	+8.2437286E+01
64.0	36	+8.3136581E+01	+9.4803437E+00	+1.0050000E+02	+6.1500000E+01	+8.2556076E+01
65.0	28	+8.1550979E+01	+6.7543374E+00	+9.0109985E+01	+6.6500000E+01	+8.2674880E+01
66.0	28	+9.0219826E+01	+9.5156443E+00	+1.0559999E+02	+7.5799987E+01	+8.2793670E+01
67.0	46	+8.6434692E+01	+8.8096820E+00	+9.7500000E+01	+7.4299987E+01	+8.2912460E+01
68.0	44	+8.1919204E+01	+6.6299910E+00	+1.0029998E+02	+6.1399993E+01	+8.3031265E+01
69.0	32	+8.3825225E+01	+6.8233374E+00	+1.0319999E+02	+7.0599990E+01	+8.3150054E+01
70.0	40	+7.9231643E+01	+8.1702557E+00	+9.3599990E+01	+6.6099990E+01	+8.3268844E+01
71.0	47	+8.1680114E+01	+1.1568504E+01	+1.0539999E+02	+5.7599990E+01	+8.3387649E+01
72.0	34	+8.1316360E+01	+6.4662732E+00	+9.4279998E+01	+7.0399993E+01	+8.3506439E+01

ANB 3066 PROPELLANT(ANB) TENSILE MAX STRESS, .0002 IN/MIN, 77 DEG F, UNLND CYNS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F = +1.4131132E+02 SIGNIFICANCE OF F = SIGNIFICANT σ1= +8.7588965E+00
R = +5.5227072E-01 SIGNIFICANCE OF R = SIGNIFICANT Sa= +3.4079094E-02
t = +1.1887443E+01 SIGNIFICANCE OF t = SIGNIFICANT Se= +7.3133136E+00
N = 324 DEGREES OF FREEDOM = 322
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = 77 DEG F, AMB RH
PARAMETER = MAXIMUM STRESS
UNIT OF MEASURE = PSI
140.00
120.00
100.00
80.00
60.00
40.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
ANB 3066 PROPELLANT(ANT) TENSILE MAX STRESS, .0002 IN/MIN, 77 DEG F, UNLND CTNS

Figure 4-9

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
15.0	1	+6.7769989E+01	+0.0000000E+55	+6.7769989E+01	+6.7769989E+01	+6.8718246E+01
16.0	3	+7.2523323E+01	+3.0117717E+00	+7.4729995E+01	+6.9139999E+01	+6.9123367E+01
17.0	2	+7.2274978E+01	+4.3344715E-01	+7.2579986E+01	+7.1959985E+01	+6.9528472E+01
18.0	3	+6.1903320E+01	+1.2210218E+00	+6.3149993E+01	+6.0709991E+01	+6.9933593E+01
21.0	3	+6.7683319E+01	+6.6820902E-01	+6.8389999E+01	+6.7059957E+01	+7.1143925E+01
23.0	3	+6.4526657E+01	+4.3857368E-01	+6.4819992E+01	+6.4019989E+01	+7.1959152E+01
25.0	4	+7.4303314E+01	+7.9951819E+00	+7.8269989E+01	+7.0279998E+01	+7.2769378E+01
26.0	17	+7.2357543E+01	+5.7413876E+00	+8.0069992E+01	+6.5000000E+01	+7.3174499E+01
27.0	13	+7.4548370E+01	+5.7867139E+00	+8.1949996E+01	+6.3299957E+01	+7.3579605E+01
28.0	22	+7.3977615E+01	+6.1309863E+00	+8.5859985E+01	+6.5500000E+01	+7.3984725E+01
29.0	8	+7.4696197E+01	+5.3649253E+00	+8.1269989E+01	+6.7599990E+01	+7.4389831E+01
30.0	15	+7.4493911E+01	+7.5192226E+00	+8.0509994E+01	+5.5199996E+01	+7.4794952E+01
31.0	30	+7.2151565E+01	+6.8952917E+00	+8.2489990E+01	+5.7439987E+01	+7.5200057E+01
32.0	22	+8.0985315E+01	+5.7894803E+00	+9.6339996E+01	+5.8179992E+01	+7.5605178E+01
33.0	5	+6.9610918E+01	+2.3138451E+00	+7.2949996E+01	+6.7529998E+01	+7.6010284E+01
34.0	15	+7.0813873E+01	+7.8084026E+00	+7.9099990E+01	+5.2289993E+01	+7.6415405E+01
35.0	11	+7.7273559E+01	+7.2439494E+00	+9.7429992E+01	+7.0509994E+01	+7.6820510E+01
37.0	4	+7.7067443E+01	+9.8086986E+00	+9.1750000E+01	+7.1459991E+01	+7.7630737E+01
38.0	3	+7.1873321E+01	+2.9982869E+00	+7.3819992E+01	+6.8419998E+01	+7.8035858E+01
39.0	3	+7.9903320E+01	+1.9501538E+00	+8.1869995E+01	+7.7969955E+01	+7.8440963E+01
40.0	1	+6.7679992E+01	+0.0000000E+35	+6.7679992E+01	+6.7679992E+01	+7.8846084E+01
41.0	8	+7.4188690E+01	+1.8000392E+00	+7.6119995E+01	+7.1389999E+01	+7.9251190E+01
43.0	3	+8.3709991E+01	+9.6265207E-01	+8.4479995E+01	+8.2629989E+01	+8.0061416E+01
44.0	4	+9.4834899E+01	+5.7951087E+00	+1.0035998E+02	+8.9579986E+01	+8.0466537E+01
46.0	5	+8.0673248E+01	+1.3398828E+01	+9.3619995E+01	+6.7479955E+01	+8.1276763E+01
47.0	10	+8.9199890E+01	+8.4874856E+00	+9.8439987E+01	+7.6109985E+01	+8.1681869E+01
48.0	6	+8.7496612E+01	+1.2865879E+00	+8.9209991E+01	+8.6109985E+01	+8.2086950E+01
49.0	5	+9.5171920E+01	+3.0029755E+00	+9.8389999E+01	+9.1119995E+01	+8.2492095E+01
50.0	9	+8.6408767E+01	+3.7515141E+00	+9.1709991E+01	+8.1459951E+01	+8.2897216E+01
51.0	3	+8.5966629E+01	+1.2268520E+00	+8.6899993E+01	+8.4579986E+01	+8.3302322E+01
52.0	3	+7.7233323E+01	+8.0193958E-01	+7.8259994E+01	+7.6869995E+01	+8.3707443E+01

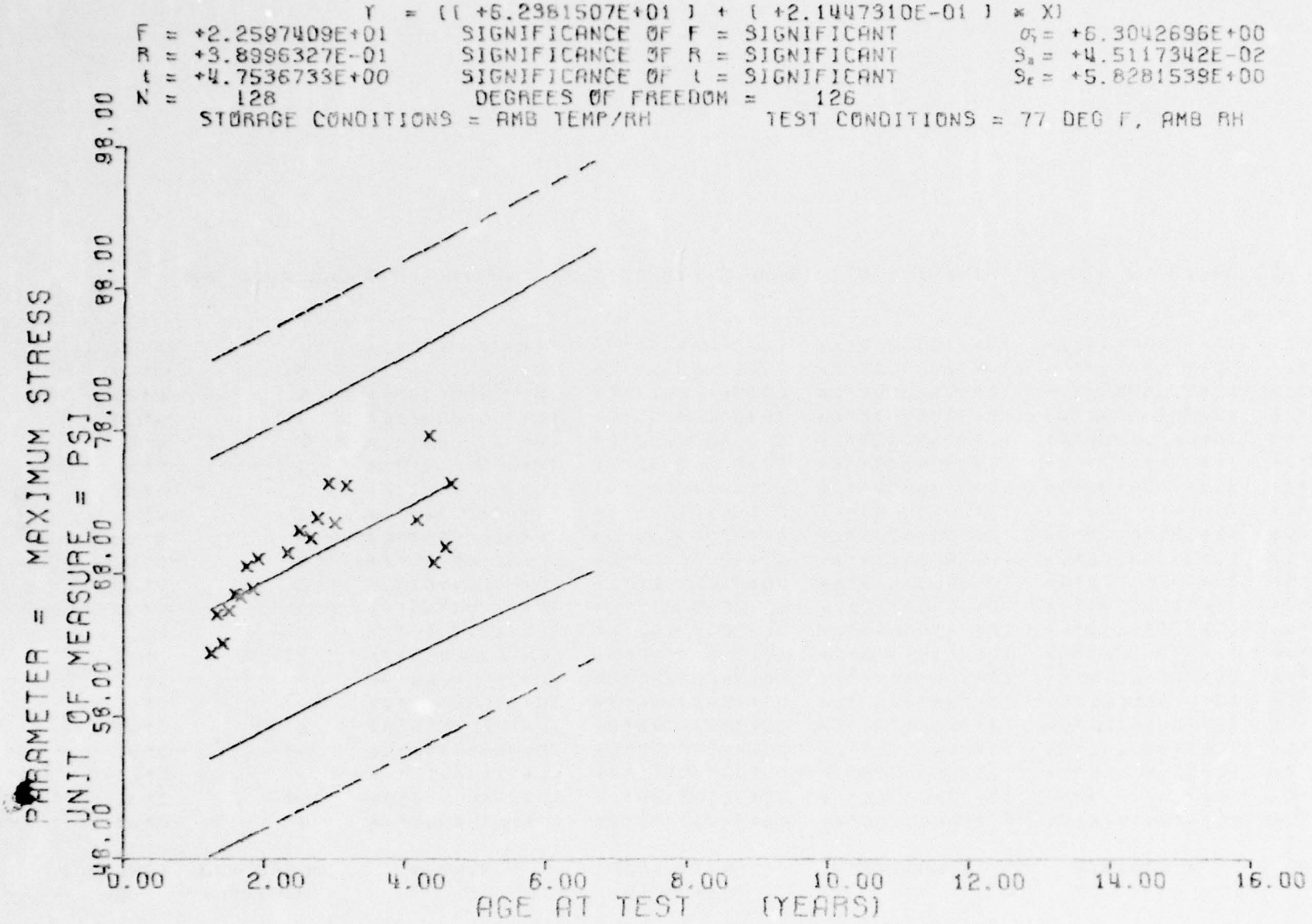
ANB 3066 PROPELLANT(ANT) TENSILE MAX STRESS, .0002 IN/MIN, 77 DEG F, UNEND CTNS

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
53.0	12	+8.640400[illegible]E+01	+5.115E223E+00	+9.3E79989E+01	+7.743[illegible]E+01	+8.4112564E+01
54.0	7	+[illegible].5541290E+01	+6.2430284E+00	+9.3259994E+01	+7.703[illegible]E+01	+8.4517669E+01
55.0	9	+8.33E2130E+01	+8.1244655E+00	+9.3259994E+01	+6.946998[illegible]E+01	+8.5327896E+01
57.0	9	+8.506[illegible]931E+01	+6.7172048E+00	+9.3500000E+01	+7.6199996E+01	+8.5733016E+01
59.0	3	+8.8853271E+01	+1.7234824E+00	+9.0209991E+01	+8.6919998E+01	+8.6543243E+01
60.0	3	+7.500332[illegible]E+01	+1.[illegible]E50+42E+00	+7.6189987E+01	+7.405[illegible]7E+01	+8.6943348E+01
61.0	[illegible]	+7.[illegible]E+01	+6.3034595E-01	+7.7149993E+01	+7.5929992E+01	+8.7353469E+01
62.0	3	+8.[illegible]78E+01	+2.1235556E+00	+8.8819992E+01	+8.4849990E+01	+8.7758575E+01
64.0	6	+7.7[illegible]3[illegible]E+01	+1.427C760E+00	+7.9089996E+01	+7.6000000E+01	+8.8568801E+01

AND 3066 PROPELLANT(ANT) TENSILE MAX STRESS, .0002 IN/MIN, 77 DEG F, UNLND CTNS



ANB 3066 PROPELLANT(ANB), TENSILE MAX STRESS, .0002 IN/MIN, 77 DEG F, LINED CTN

Figure 4-10

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
15.0	6	+6.2504213E+01	+8.3971558E+00	+7.0469985E+01	+5.3189987E+01	+6.5598602E+01
16.0	15	+6.5208372E+01	+8.9842537E+00	+7.7729995E+01	+4.4149993E+01	+6.5813064E+01
17.0	[illegible]	+6.3159342E+01	+5.7245412E+00	+6.8109985E+01	+5.2399993E+01	+6.6027542E+01
18.0	16	+6.5460510E+01	+6.3159264E+00	+7.6259994E+01	+5.2579986E+01	+6.6242019E+01
19.0	7	+6.6592773E+01	+2.5668732E+00	+7.0529998E+01	+6.1909989E+01	+6.6456481E+01
20.0	6	+6.6458251E+01	+6.0986645E+00	+7.4719985E+01	+5.5539993E+01	+6.6670959E+01
21.0	6	+6.8564960E+01	+8.1871379E+00	+7.7739990E+01	+5.4709991E+01	+6.6885437E+01
22.0	12	+6.6993240E+01	+2.3417498E+00	+6.9769989E+01	+6.1739990E+01	+6.7099914E+01
23.0	3	+6.9102127E+01	+7.3574303E+00	+7.9669998E+01	+6.1979995E+01	+6.7314376E+01
28.0	5	+6.9511627E+01	+3.0335580E+00	+7.3119995E+01	+6.6459991E+01	+6.8386749E+01
30.0	6	+7.1044952E+01	+5.1315521E+00	+7.6279998E+01	+6.5329986E+01	+6.8815689E+01
32.0	6	+7.0534942E+01	+2.6507938E+00	+7.4229995E+01	+6.7699996E+01	+6.9244644E+01
33.0	6	+7.1943267E+01	+6.6006662E+00	+7.9019989E+01	+6.4409988E+01	+6.9459106E+01
35.0	3	+7.4373321E+01	+3.7632253E+00	+7.8099990E+01	+7.0529998E+01	+6.9888061E+01
36.0	3	+7.1596649E+01	+4.8447194E+00	+7.7189987E+01	+6.8699996E+01	+7.0102539E+01
38.0	1	+7.4199996E+01	+0.0000000E+23	+7.4199996E+01	+7.4199996E+01	+7.0531478E+01
50.0	3	+7.1833312E+01	+3.2078970E+00	+7.4959991E+01	+6.8549987E+01	+7.3105148E+01
52.0	1	+7.7699996E+01	+0.0000000E+91	+7.7699996E+01	+7.7699996E+01	+7.3534103E+01
53.0	3	+6.8819992E+01	+2.6153377E+00	+7.1839996E+01	+6.7289993E+01	+7.3748580E+01
55.0	4	+6.9907470E+01	+1.6810187E+00	+7.2299987E+01	+6.8459991E+01	+7.4177520E+01
56.0	3	+7.4319992E+01	+2.4085684E+00	+7.6250000E+01	+7.1619995E+01	+7.4391598E+01

ANB 3066 PROPELLANT(ANB), TENSILE MAX STRESS, .0002 IN/MIN, 77 DEG F, LINED CTN

Y = ((+6.4735807E+01) + (+2.0870193E-01) * XJ

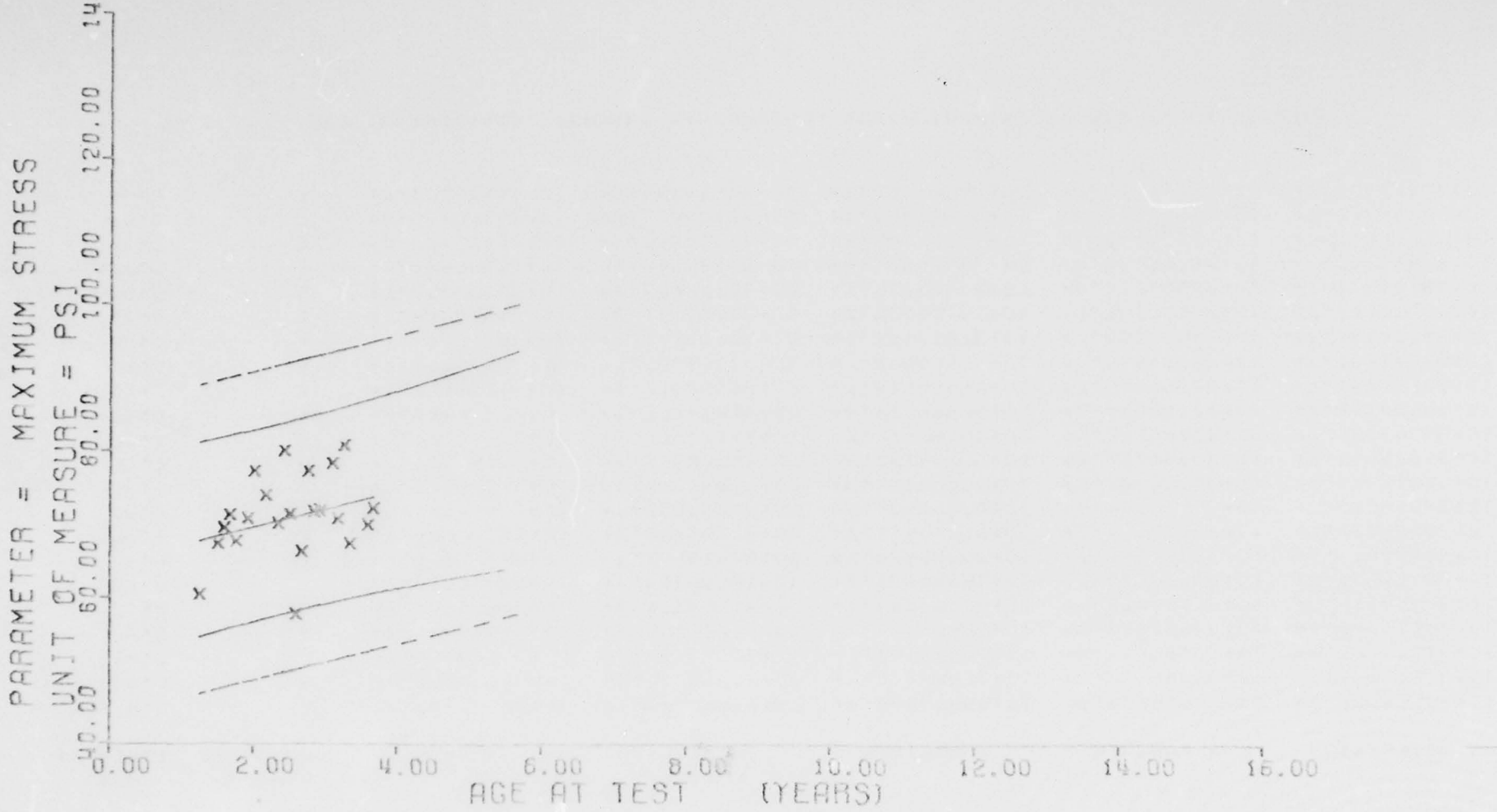
F = +4.6322572E+00 SIGNIFICANCE OF F = SIGNIFICANT σ_1 = +7.2358278E+00

R = +2.3968559E-01 SIGNIFICANCE OF R = SIGNIFICANT S_a = +8.6966380E-02

t = +2.1522679E+00 SIGNIFICANCE OF t = SIGNIFICANT S_Y = +7.0709729E+00

N = 78 DEGREES OF FREEDOM = 76

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = 77 DEG F, AMB RH



ANB 3066 PROPELLANT(ANT), TENSILE MAX STRESS, .0002 IN/MIN, 77 DEG F, LINED CTN

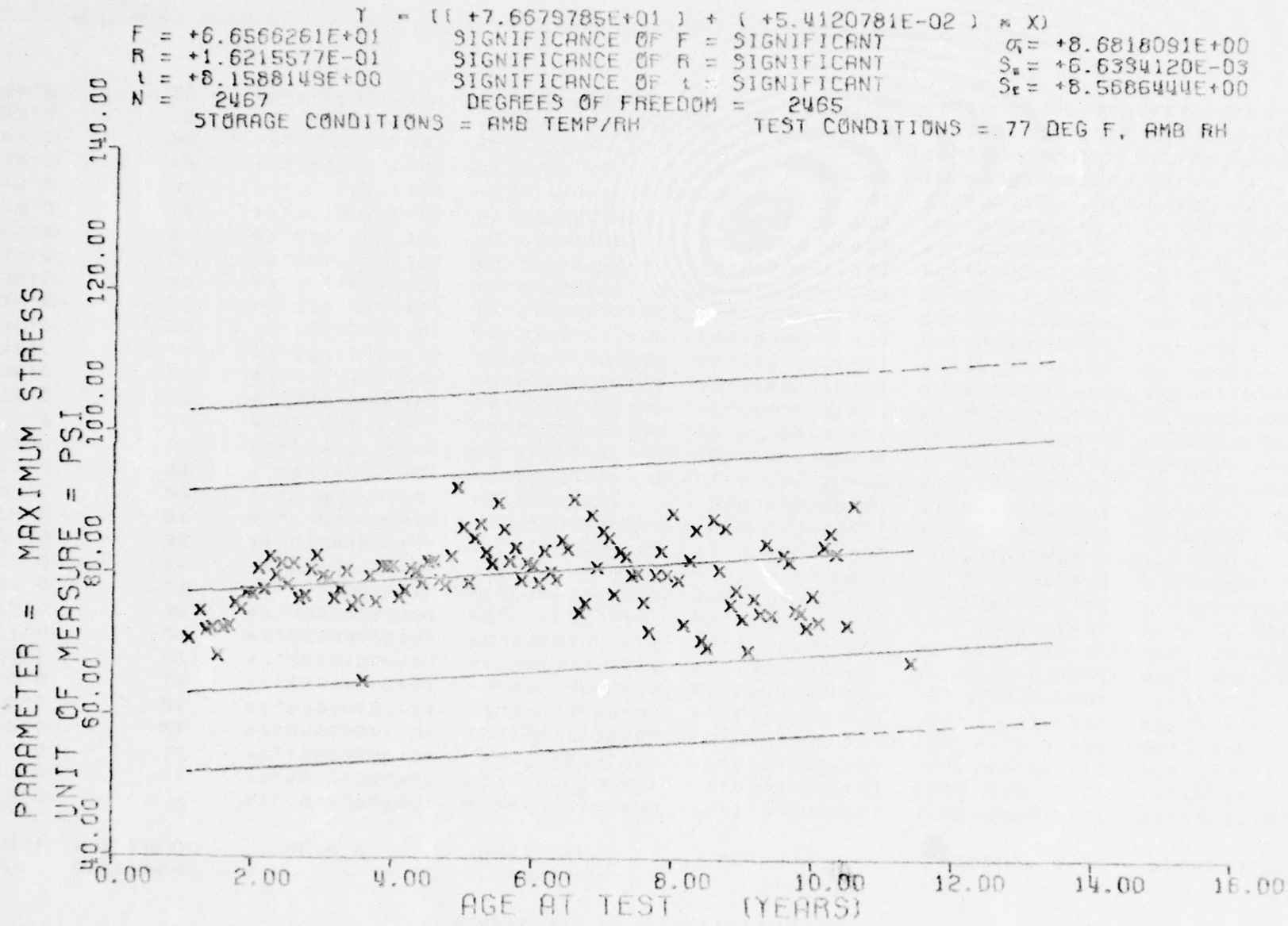
Figure 4-11

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
15.0	3	+6.0466659E+01	+3.6602997E+00	+6.2619995E+01	+5.6229995E+01	+6.7806333E+01
16.0	[illegible]	+6.7396605E+01	+2.1632085E+00	+7.0139999E+01	+6.2959991E+01	+6.8492431E+01
19.0	3	+6.5566659E+01	+1.3812033E+00	+7.0619995E+01	+6.8139999E+01	+6.8701141E+01
20.0	3	+7.1366653E+01	+1.6946830E+00	+7.3319992E+01	+7.0289993E+01	+6.8909835E+01
21.0	6	+6.7656599E+01	+6.6774821E+00	+7.4929992E+01	+5.5799991E+01	+6.9118545E+01
23.0	3	+7.0863327E+01	+7.6119503E-01	+7.1659988E+01	+7.0139999E+01	+6.9535949E+01
24.0	3	+7.7356643E+01	+1.2391162E+00	+7.8359985E+01	+7.5969985E+01	+6.9744644E+01
26.0	3	+7.4033325E+01	+1.9071576E+00	+7.5299987E+01	+7.1839996E+01	+7.0162048E+01
28.0	3	+7.0126647E+01	+1.5040501E+00	+7.1639987E+01	+6.8679992E+01	+7.0579452E+01
29.0	3	+8.0103317E+01	+1.8411269E+00	+8.2219985E+01	+7.8869995E+01	+7.0788162E+01
30.0	6	+7.1496602E+01	+9.1663089E+00	+8.3819992E+01	+6.2239990E+01	+7.0996856E+01
31.0	3	+5.7723322E+01	+2.0791314E+01	+7.0449996E+01	+3.3739990E+01	+7.1205566E+01
32.0	3	+6.6363327E+01	+1.7331658E+00	+6.8289993E+01	+6.4929992E+01	+7.1414260E+01
33.0	3	+7.7373321E+01	+1.7182952E+00	+7.8759994E+01	+7.5449996E+01	+7.1622970E+01
34.0	3	+7.1786651E+01	+9.9652111E-01	+7.2554997E+01	+7.0659988E+01	+7.1831665E+01
35.0	3	+7.1966659E+01	+1.3120942E+00	+7.3059997E+01	+7.0509994E+01	+7.2040374E+01
37.0	3	+7.8466644E+01	+8.1946235E-01	+7.8969985E+01	+7.7519989E+01	+7.2457763E+01
38.0	6	+7.0829910E+01	+7.7737572E+00	+7.8079986E+01	+6.3539993E+01	+7.2666473E+01
39.0	3	+8.0859985E+01	+2.7336849E-01	+8.1259994E+01	+8.0519989E+01	+7.2875167E+01
40.0	3	+6.7523315E+01	+1.7556146E+00	+6.8609985E+01	+6.5449996E+01	+7.3083877E+01
43.0	3	+6.9993316E+01	+5.6330810E-01	+7.0549997E+01	+6.9419998E+01	+7.3709576E+01
44.0	3	+7.2226654E+01	+9.4874195E-01	+7.2979995E+01	+7.1159988E+01	+7.3918685E+01

ANB 3066 PROPELLANT(ANT), TENSILE MAX STRESS, .0002 IN/MIN, 77 DEC F, LINED CTN



ANB 3066 PROPELLANT (ALL ANB) TENS MAXIMUM STRESS, .0002 IN/MIN, 77 DEG F

Figure 4-12

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
13.0	7	+7.0747070E+01	+4.1023044E+00	+7.7299987E+01	+6.6439987E+01	+7.7383346E+01
15.0	21	+7.4625137E+01	+1.0756648E+01	+9.0399993E+01	+5.3189987E+01	+7.7491592E+01
16.0	45	+7.1886566E+01	+9.6561599E+00	+8.9899993E+01	+4.4149993E+01	+7.7545715E+01
17.0	21	+7.2296554E+01	+9.8754172E+00	+8.8299987E+01	+5.2399993E+01	+7.7599838E+01
18.0	26	+6.8392013E+01	+7.2290808E+00	+8.6399993E+01	+5.2579986E+01	+7.7653945E+01
19.0	18	+7.2339889E+01	+5.4844288E+00	+7.9500000E+01	+6.1909988E+01	+7.7708068E+01
20.0	27	+7.2616195E+01	+6.8553858E+00	+8.5349990E+01	+5.9539993E+01	+7.7762191E+01
21.0	37	+7.5863937E+01	+5.8849156E+00	+8.4519989E+01	+5.4709991E+01	+7.7816314E+01
22.0	35	+7.4922744E+01	+7.9276271E+00	+9.0799987E+01	+6.1739990E+01	+7.7870437E+01
23.0	19	+7.7235687E+01	+1.0122281E+01	+9.1099990E+01	+6.1979995E+01	+7.7924560E+01
24.0	15	+7.7172607E+01	+7.1984867E+00	+8.7699990E+01	+6.6000000E+01	+7.7978683E+01
25.0	33	+8.0718688E+01	+5.8762098E+00	+9.1000000E+01	+6.8919998E+01	+7.8032791E+01
26.0	27	+7.7725845E+01	+7.0736828E+00	+9.0389999E+01	+6.7829986E+01	+7.8086914E+01
27.0	22	+8.2398529E+01	+6.2963343E+00	+9.5399993E+01	+7.4599990E+01	+7.8141036E+01
28.0	36	+7.9728805E+01	+1.0923251E+01	+1.0629998E+02	+4.4699996E+01	+7.8195159E+01
29.0	12	+8.1480743E+01	+5.8047124E+00	+8.9000000E+01	+6.7899993E+01	+7.8249282E+01
30.0	16	+7.8499923E+01	+7.1452392E+00	+8.7799987E+01	+6.5329986E+01	+7.8303405E+01
31.0	13	+8.1445266E+01	+4.5739158E+00	+9.0399993E+01	+7.6259994E+01	+7.8357528E+01
32.0	27	+7.6461380E+01	+5.3232861E+00	+8.6799987E+01	+6.7699996E+01	+7.8411636E+01
33.0	39	+7.6874008E+01	+9.6566160E+00	+9.3500000E+01	+5.8799987E+01	+7.8465759E+01
34.0	17	+8.0559361E+01	+6.3257201E+00	+9.0899993E+01	+7.1500000E+01	+7.8519882E+01
35.0	23	+8.2602508E+01	+4.9132385E+00	+9.1500000E+01	+7.0529998E+01	+7.8574005E+01
36.0	47	+7.9691833E+01	+6.5771665E+00	+9.6799987E+01	+6.6329986E+01	+7.8628128E+01
37.0	26	+7.9354522E+01	+6.9715818E+00	+8.9199996E+01	+6.6299987E+01	+7.8682250E+01
38.0	34	+7.6499908E+01	+6.4154128E+00	+8.7399993E+01	+6.4000000E+01	+7.8736373E+01
39.0	12	+7.7916625E+01	+1.0132610E+01	+9.5000000E+01	+6.7000000E+01	+7.8790481E+01
40.0	27	+8.0336944E+01	+6.5774463E+00	+9.2000000E+01	+7.1000000E+01	+7.8844604E+01
41.0	22	+7.5490829E+01	+6.0693368E+00	+8.5799987E+01	+6.6500000E+01	+7.8898727E+01
42.0	20	+7.6303405E+01	+5.6731970E+00	+8.8549987E+01	+6.8000000E+01	+7.8952850E+01
43.0	9	+6.4928817E+01	+1.4048470E+01	+9.2239990E+01	+5.0599990E+01	+7.9006973E+01
44.0	25	+7.9696304E+01	+6.4566581E+00	+8.9389999E+01	+6.1500000E+01	+7.9061096E+01

ANB 3066 PROPELLANT (ALL ANB) TENS MAXIMUM STRESS, .0002 IN/MIN, 77 DEG F

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
45.0	20	+7.6027404E+01	+5.7585151E+00	+8.3799987E+01	+6.5759994E+01	+7.9115219E+01
46.0	44	+8.1155593E+01	+5.6697673E+00	+9.3399993E+01	+7.0199996E+01	+7.9169326E+01
47.0	12	+8.1101577E+01	+6.8396346E+00	+9.3259994E+01	+7.3199996E+01	+7.9223449E+01
48.0	20	+8.1214904E+01	+6.1387259E+00	+9.5419998E+01	+7.3299987E+01	+7.9277572E+01
49.0	22	+7.6723999E+01	+9.0693504E+00	+9.7269989E+01	+6.3199996E+01	+7.9331695E+01
50.0	32	+7.7710525E+01	+7.6208536E+00	+9.2399993E+01	+6.2899993E+01	+7.9385818E+01
51.0	57	+8.0777130E+01	+7.0749497E+00	+9.6039993E+01	+6.5019989E+01	+7.9439941E+01
52.0	51	+8.0451431E+01	+5.0644985E+00	+9.5799987E+01	+6.5799987E+01	+7.9494064E+01
53.0	40	+7.8740386E+01	+6.9134652E+00	+9.5039993E+01	+6.7289993E+01	+7.9548171E+01
54.0	19	+8.1768310E+01	+7.6525664E+00	+9.1799987E+01	+5.8799987E+01	+7.9602294E+01
55.0	46	+8.1894699E+01	+6.7115737E+00	+9.7699996E+01	+6.8459991E+01	+7.9656417E+01
56.0	62	+7.9179992E+01	+4.6405623E+00	+9.1399993E+01	+6.6699998E+01	+7.9710540E+01
57.0	46	+7.8460556E+01	+6.5721580E+00	+8.9699996E+01	+6.9399993E+01	+7.9764663E+01
58.0	34	+8.2624023E+01	+6.8119551E+00	+9.5000000E+01	+7.0999988E+01	+7.9818786E+01
59.0	20	+9.2346420E+01	+6.7405369E+00	+1.0300000E+02	+7.6729995E+01	+7.9872909E+01
60.0	20	+8.6679870E+01	+7.3399614E+00	+9.3299987E+01	+6.0899993E+01	+7.9927032E+01
61.0	40	+7.8849624E+01	+8.6878910E+00	+9.4000000E+01	+6.1199996E+01	+7.9981140E+01
62.0	35	+8.5151611E+01	+7.8220164E+00	+9.5599990E+01	+6.4899993E+01	+8.0035263E+01
63.0	45	+8.7134567E+01	+7.9507533E+00	+9.8599990E+01	+6.5599990E+01	+8.0089385E+01
64.0	36	+8.3136581E+01	+9.4803437E+00	+1.0050000E+02	+6.1500000E+01	+8.0143508E+01
65.0	28	+8.1550979E+01	+6.7543374E+00	+9.0109985E+01	+6.6500000E+01	+8.0197631E+01
66.0	28	+9.0218826E+01	+9.5156443E+00	+1.0559990E+02	+7.5799987E+01	+8.0251754E+01
67.0	46	+8.6434692E+01	+6.8096820E+00	+9.7500000E+01	+7.4299987E+01	+8.0305877E+01
68.0	44	+8.1919204E+01	+6.6299910E+00	+1.0029998E+02	+6.1399993E+01	+8.0359985E+01
69.0	32	+8.3825225E+01	+6.8233374E+00	+1.0319999E+02	+7.0599990E+01	+8.0414108E+01
70.0	40	+7.9231643E+01	+8.1702557E+00	+9.3599990E+01	+6.6099990E+01	+8.0468231E+01
71.0	47	+8.1680114E+01	+1.1568504E+01	+1.0539999E+02	+5.7599990E+01	+8.0522354E+01
72.0	34	+8.1316360E+01	+6.4602738E+00	+9.4279998E+01	+7.0399993E+01	+8.0576477E+01
73.0	27	+7.8836578E+01	+1.1196590E+01	+9.6500000E+01	+5.9799987E+01	+8.0630599E+01
74.0	15	+8.3333206E+01	+9.1079563E+00	+9.9799987E+01	+7.2000000E+01	+8.0684722E+01
75.0	30	+8.0409927E+01	+8.5612448E+00	+1.0250000E+02	+6.7899993E+01	+8.0738830E+01

ANB 3066 PROPELLANT (ALL ANB) TENS MAXIMUM STRESS, .0002 IN/MIN, 77 DEG F

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
76.0	17	+7.9348144E+01	+8.2102625E+00	+9.0479995E+01	+6.5899993E+01	+8.0792953E+01
77.0	19	+8.4942520E+01	+6.9832009E+00	+9.6299987E+01	+6.9459991E+01	+8.0847076E+01
78.0	25	+8.3640701E+01	+5.0011610E+00	+9.1499968E+01	+7.4599990E+01	+8.0901199E+01
79.0	17	+9.0724609E+01	+1.1623707E+01	+1.0729998E+02	+7.5119995E+01	+8.0955322E+01
80.0	33	+7.4674728E+01	+6.9864380E+00	+8.9399993E+01	+6.1099990E+01	+8.1009445E+01
81.0	26	+7.5976806E+01	+7.6763172E+00	+8.7099990E+01	+5.5299987E+01	+8.1063568E+01
82.0	15	+8.8485244E+01	+6.1514958E+00	+9.8599990E+01	+7.8699996E+01	+8.1117675E+01
83.0	33	+8.1082916E+01	+7.2365410E+00	+9.4659988E+01	+6.4500000E+01	+8.1171798E+01
84.0	42	+8.6194885E+01	+8.1795939E+00	+1.0600000E+02	+6.7239990E+01	+8.1225921E+01
85.0	15	+8.5252532E+01	+9.2033330E+00	+9.4759994E+01	+6.4239990E+01	+8.1280044E+01
86.0	22	+7.7230361E+01	+9.7167447E+00	+9.4719985E+01	+6.3000000E+01	+8.1334167E+01
87.0	23	+8.3348648E+01	+6.3046897E+00	+9.7539993E+01	+7.3199996E+01	+8.1388290E+01
88.0	32	+8.2632720E+01	+7.6341121E+00	+9.7519989E+01	+6.8829986E+01	+8.1442413E+01
89.0	31	+8.0008911E+01	+7.8228379E+00	+9.5329986E+01	+6.2079986E+01	+8.1496520E+01
90.0	11	+8.0208084E+01	+1.1467175E+01	+9.4000000E+01	+6.5369995E+01	+8.1550643E+01
91.0	9	+7.6204360E+01	+5.8337466E+00	+8.6209991E+01	+7.0219985E+01	+8.1604766E+01
92.0	17	+7.1992843E+01	+5.0883257E+00	+8.0799987E+01	+6.2699996E+01	+8.1658889E+01
93.0	15	+8.0060577E+01	+9.1607346E+00	+9.3049987E+01	+6.8199996E+01	+8.1713012E+01
94.0	13	+8.3571411E+01	+7.6648805E+00	+9.2899993E+01	+6.9799987E+01	+8.1767136E+01
95.0	24	+8.0096130E+01	+6.8216720E+00	+9.3129989E+01	+6.6299987E+01	+8.1821258E+01
96.0	11	+8.8782638E+01	+3.7830879E+00	+9.6500000E+01	+8.5429992E+01	+8.1875366E+01
97.0	6	+7.9348297E+01	+5.9631456E+00	+8.6129989E+01	+7.1250000E+01	+8.1929489E+01
98.0	9	+7.3146606E+01	+2.0215930E+00	+7.6039993E+01	+6.9199996E+01	+8.1983612E+01
99.0	5	+8.2201950E+01	+8.1736401E+00	+9.3000000E+01	+7.2500000E+01	+8.2037734E+01
100.0	2	+8.6500000E+01	+1.2020815E+01	+9.5000000E+01	+7.8000000E+01	+8.2091857E+01
101.0	11	+7.0931716E+01	+9.7539530E+00	+9.3909988E+01	+5.9539993E+01	+8.2145980E+01
102.0	3	+6.9896652E+01	+2.1884838E+00	+7.2159988E+01	+6.7789993E+01	+8.2200103E+01
103.0	2	+8.0000000E+01	+2.8284271E+00	+9.0000000E+01	+8.6000000E+01	+8.2254211E+01
104.0	7	+8.0849914E+01	+6.5404646E+00	+8.9939987E+01	+7.2899993E+01	+8.2308334E+01
105.0	9	+8.6852157E+01	+6.4330381E+00	+9.7579986E+01	+7.8539993E+01	+8.2362457E+01
106.0	11	+7.6024444E+01	+9.9640234E+00	+9.4000000E+01	+6.2679992E+01	+8.2416580E+01

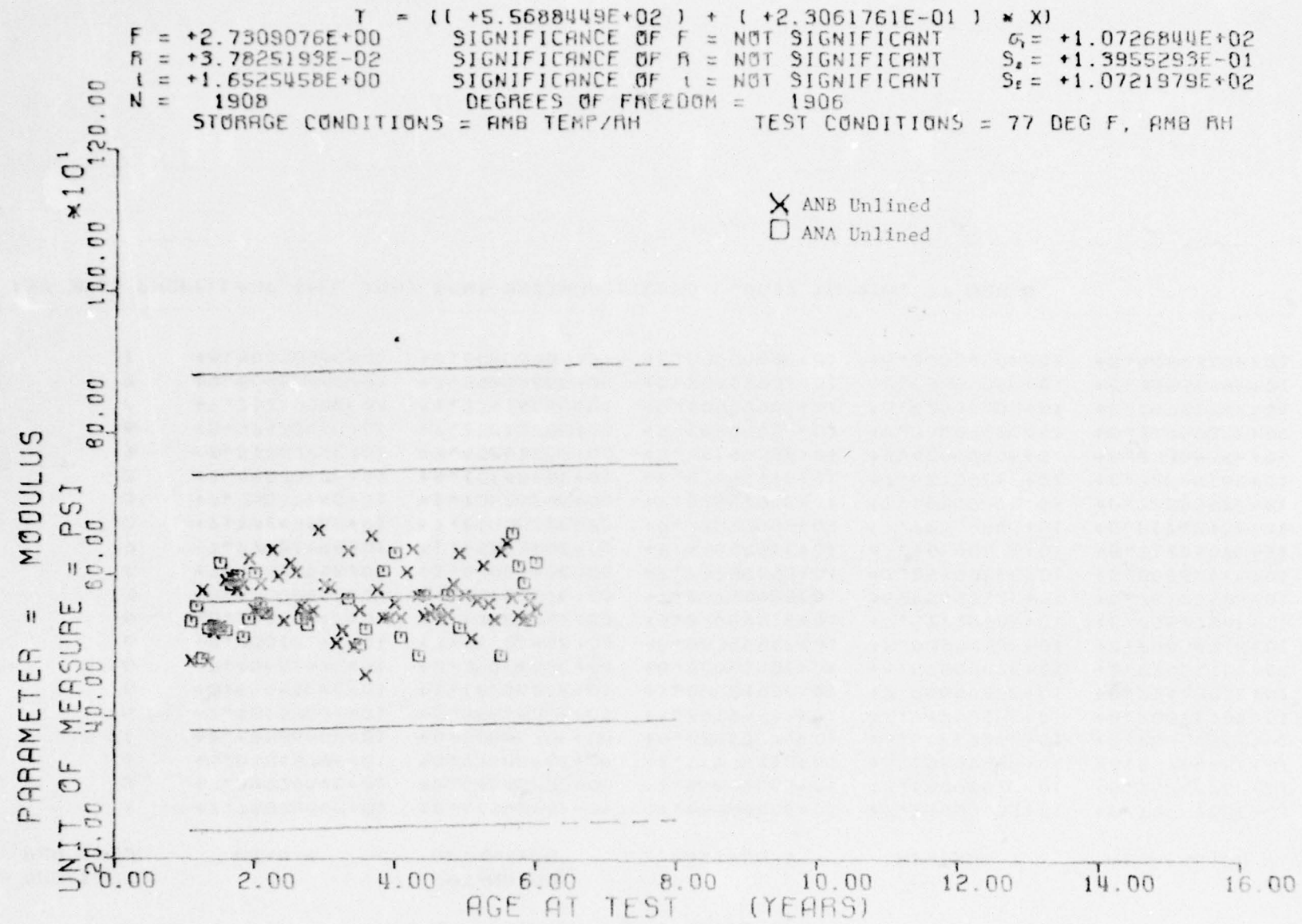
AND 3066 PROPELLANT (ALL AND) TENS MAXIMUM STRESS, .0002 IN/MIN, 77 DEG F

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
107.0	2	+7.7999984E+01	+8.4689085E-01	+7.8599990E+01	+7.7399993E+01	+8.2470703E+01
108.0	3	+7.3999984E+01	+2.0884523E+00	+7.5969985E+01	+7.1809997E+01	+8.2524826E+01
109.0	14	+6.9454879E+01	+6.0300546E+00	+7.9459991E+01	+6.1989990E+01	+8.2578948E+01
110.0	11	+7.6852645E+01	+8.0280570E+00	+9.2299987E+01	+6.5479995E+01	+8.2633056E+01
111.0	5	+7.4815963E+01	+6.3961829E+00	+8.3419998E+01	+6.7479995E+01	+8.2687179E+01
112.0	6	+8.4594924E+01	+1.1615481E+01	+1.0252999E+02	+7.2969985E+01	+8.2741302E+01
113.0	18	+7.4566543E+01	+8.3904482E+00	+8.3000000E+01	+4.8799987E+01	+8.2795425E+01
115.0	6	+8.3001617E+01	+3.4692844E+00	+8.9639999E+01	+8.0399993E+01	+8.2903671E+01
116.0	6	+8.2041534E+01	+6.1798626E+00	+9.2209991E+01	+7.5779998E+01	+8.2957794E+01
117.0	3	+7.5339996E+01	+4.9971951E+00	+7.8279998E+01	+6.9569992E+01	+8.3011917E+01
118.0	4	+7.4887451E+01	+1.6706445E+00	+7.7379989E+01	+7.3919998E+01	+8.3066024E+01
119.0	9	+7.2792144E+01	+1.1957399E+00	+7.4459991E+01	+7.1059997E+01	+8.3120147E+01
120.0	2	+7.7324996E+01	+7.8103512E-02	+7.7389999E+01	+7.7259994E+01	+8.3174270E+01
121.0	3	+7.3553314E+01	+1.7352654E+00	+7.5389999E+01	+7.1939987E+01	+8.3228393E+01
122.0	3	+8.4193313E+01	+6.6214665E+00	+8.8709991E+01	+7.6579986E+01	+8.3282516E+01
123.0	9	+8.6126571E+01	+7.4528330E+00	+9.4019989E+01	+7.4099990E+01	+8.3336639E+01
124.0	6	+8.3243240E+01	+7.2501275E+00	+9.1979995E+01	+7.3059997E+01	+8.3390762E+01
126.0	6	+7.3171585E+01	+1.2381426E+01	+9.1099990E+01	+5.9250000E+01	+8.3498992E+01
127.0	3	+9.0096588E+01	+3.3926286E+00	+9.3039993E+01	+8.6389999E+01	+8.3553115E+01
137.0	1	+6.8000000E+01	+0.0000000E+27	+6.8000000E+01	+6.8000000E+01	+8.4094329E+01

ANB 3066 PROPELLANT (ALL ANB) TENS MAXIMUM STRESS, .0002 IN/MIN, 77 DEG F



ANB 3066 PROPELLANT TENSILE MODULUS CHS .0002, 77 DEG F, ANA UNLND VS ANB UNLND

Figure 4-13

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
13.0	12	+5.0125000E+02	+4.4393130E+01	+5.8200000E+02	+4.3200000E+02	+5.5988232E+02
14.0	16	+5.5587500E+02	+3.4711909E+01	+5.9600000E+02	+4.6200000E+02	+5.6011303E+02
15.0	29	+5.3151708E+02	+7.1975005E+01	+6.7300000E+02	+4.1200000E+02	+5.6034375E+02
16.0	35	+4.8408569E+02	+6.3731685E+01	+6.2900000E+02	+3.4400000E+02	+5.6057421E+02
17.0	25	+5.2303979E+02	+6.9719366E+01	+7.1300000E+02	+4.0900000E+02	+5.6080493E+02
18.0	27	+5.7833325E+02	+8.5133831E+01	+7.1900000E+02	+4.2000000E+02	+5.6103540E+02
19.0	24	+5.5470825E+02	+8.3641823E+01	+6.7300000E+02	+3.8300000E+02	+5.6126611E+02
20.0	33	+5.9372705E+02	+7.6981439E+01	+8.1400000E+02	+4.4800000E+02	+5.6149682E+02
21.0	46	+5.8621728E+02	+7.9019804E+01	+7.8500000E+02	+4.4000000E+02	+5.6172729E+02
22.0	37	+5.5910791E+02	+8.9983573E+01	+7.6800000E+02	+3.7700000E+02	+5.6195800E+02
23.0	20	+5.8104980E+02	+8.3289902E+01	+7.0700000E+02	+4.5300000E+02	+5.6218847E+02
24.0	25	+5.7167993E+02	+7.1687237E+01	+7.1500000E+02	+4.6200000E+02	+5.6241918E+02
25.0	48	+5.7887500E+02	+7.3412743E+01	+7.0400000E+02	+4.3700000E+02	+5.6264990E+02
26.0	42	+5.4611889E+02	+6.4943954E+01	+6.7500000E+02	+4.1800000E+02	+5.6288037E+02
27.0	22	+6.3645434E+02	+6.6871395E+01	+7.6000000E+02	+5.2200000E+02	+5.6311108E+02
28.0	30	+5.9863330E+02	+6.4444300E+01	+6.9300000E+02	+3.8700000E+02	+5.6334155E+02
29.0	12	+5.3591650E+02	+7.6623588E+01	+6.2700000E+02	+4.0000000E+02	+5.6357226E+02
30.0	10	+6.1739990E+02	+7.4326905E+01	+7.3600000E+02	+5.1800000E+02	+5.6380297E+02
31.0	13	+6.0500000E+02	+6.8944422E+01	+7.3100000E+02	+5.1600000E+02	+5.6403344E+02
32.0	26	+5.5288452E+02	+4.9533283E+01	+6.3900000E+02	+4.5900000E+02	+5.6426416E+02
33.0	38	+5.4389453E+02	+8.2854411E+01	+7.3600000E+02	+4.0400000E+02	+5.6449487E+02
34.0	17	+5.4994116E+02	+1.0127960E+02	+6.9300000E+02	+4.0000000E+02	+5.6472534E+02
35.0	20	+6.6479980E+02	+2.0543729E+02	+1.3240000E+03	+5.1200000E+02	+5.6495605E+02
36.0	44	+5.8729541E+02	+8.1696141E+01	+7.4600000E+02	+4.1300000E+02	+5.6518652E+02
37.0	26	+5.8319213E+02	+1.0678427E+02	+7.7300000E+02	+4.2100000E+02	+5.6541723E+02
38.0	33	+5.0348461E+02	+6.7692374E+01	+6.6700000E+02	+3.9500000E+02	+5.6564794E+02
39.0	13	+5.2200000E+02	+1.5598931E+02	+8.7200000E+02	+3.8700000E+02	+5.6587841E+02
40.0	32	+6.2428125E+02	+1.9911695E+02	+1.2130000E+03	+4.6000000E+02	+5.6610913E+02
41.0	22	+4.9831811E+02	+4.6054198E+01	+5.6500000E+02	+4.0500000E+02	+5.6633959E+02
42.0	25	+5.4055981E+02	+4.9085877E+01	+6.4600000E+02	+4.5800000E+02	+5.6657031E+02
43.0	14	+4.8207128E+02	+1.1259762E+02	+7.1600000E+02	+3.3600000E+02	+5.6680102E+02

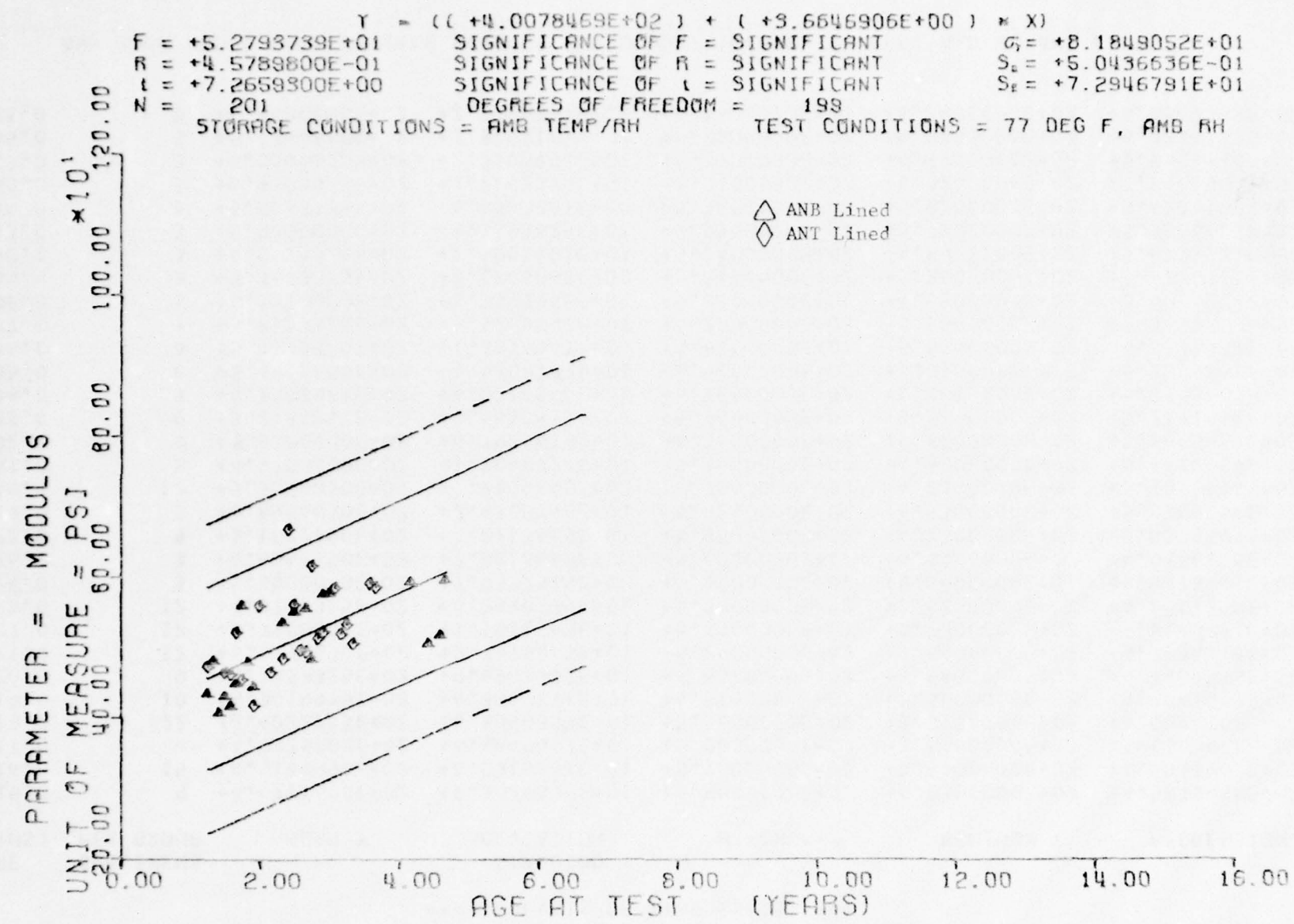
ANB 3066 PROPELLANT TENSILE MODULUS CMS .0002, 77 DEG F, ANA UNLND VS ANB UNLND

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
44.0	25	+6.5679980E+02	+1.1186226E+02	+9.6600000E+02	+4.5800000E+02	+5.6703149E+02
45.0	20	+5.8050000E+02	+8.4686729E+01	+7.5200000E+02	+4.5500000E+02	+5.6726220E+02
46.0	49	+5.4675488E+02	+5.4226197E+01	+6.5800000E+02	+4.4900000E+02	+5.6749267E+02
47.0	12	+5.3925000E+02	+3.9055031E+01	+5.7600000E+02	+4.7700000E+02	+5.6772338E+02
48.0	23	+5.7047802E+02	+1.1380800E+02	+9.7400000E+02	+4.7900000E+02	+5.6795410E+02
49.0	29	+5.3327563E+02	+9.8313600E+01	+8.0500000E+02	+4.1700000E+02	+5.6818457E+02
50.0	29	+6.0448266E+02	+1.4666960E+02	+9.4200000E+02	+4.0000000E+02	+5.6841528E+02
51.0	57	+6.3729809E+02	+1.9012627E+02	+1.3460000E+03	+4.3100000E+02	+5.6864599E+02
52.0	58	+5.5905151E+02	+6.5922315E+01	+6.9000000E+02	+4.4900000E+02	+5.6887646E+02
53.0	48	+5.4906250E+02	+5.6993992E+01	+7.1000000E+02	+4.1500000E+02	+5.6910717E+02
54.0	19	+5.4605249E+02	+6.1264883E+01	+6.7800000E+02	+4.5300000E+02	+5.6933764E+02
55.0	44	+5.5220434E+02	+9.5665497E+01	+8.5900000E+02	+4.1300000E+02	+5.6956835E+02
56.0	59	+5.3847436E+02	+8.7368296E+01	+8.4800000E+02	+3.9500000E+02	+5.6979907E+02
57.0	49	+5.4712231E+02	+8.7329031E+01	+7.3600000E+02	+4.1600000E+02	+5.7002954E+02
58.0	35	+5.8848559E+02	+1.0062375E+02	+8.7000000E+02	+4.5300000E+02	+5.7026025E+02
59.0	25	+6.1115991E+02	+8.5582163E+01	+7.6000000E+02	+5.1900000E+02	+5.7049072E+02
60.0	20	+5.7264990E+02	+4.4530622E+01	+6.4000000E+02	+4.7000000E+02	+5.7072143E+02
61.0	40	+5.1144995E+02	+1.1212674E+02	+6.7800000E+02	+1.9700000E+02	+5.7095214E+02
62.0	35	+5.6379980E+02	+9.7291194E+01	+9.4700000E+02	+4.0500000E+02	+5.7118261E+02
63.0	45	+6.1444433E+02	+1.9297969E+02	+1.5150000E+03	+4.4000000E+02	+5.7141333E+02
64.0	36	+5.6050000E+02	+9.1732063E+01	+7.8800000E+02	+3.6700000E+02	+5.7164379E+02
65.0	28	+5.3767846E+02	+7.6896781E+01	+6.7500000E+02	+3.9200000E+02	+5.7187451E+02
66.0	31	+6.1954833E+02	+1.2651556E+02	+8.9500000E+02	+4.3000000E+02	+5.7210522E+02
67.0	46	+6.4671728E+02	+1.4961196E+02	+9.4700000E+02	+4.2400000E+02	+5.7233569E+02
68.0	47	+5.7419140E+02	+1.2135998E+02	+9.6000000E+02	+3.6300000E+02	+5.7256640E+02
69.0	41	+5.5848779E+02	+6.2393958E+01	+6.9300000E+02	+4.5300000E+02	+5.7279687E+02
70.0	48	+5.4520825E+02	+8.6118166E+01	+8.0000000E+02	+4.2200000E+02	+5.7302758E+02
71.0	57	+5.5868408E+02	+1.2957935E+02	+1.0740000E+03	+3.8500000E+02	+5.7325830E+02
72.0	37	+5.5829711E+02	+7.6297977E+01	+7.6600000E+02	+4.1600000E+02	+5.7348876E+02

ANB 3066 PROPELLANT TENSILE MODULUS CHS .0002, 77 DEG F, ANA UNLND VS ANB UNLND



ANB 3066 PROPELLANT TENSILE MODULUS CHS 0.0002 IN/MIN, 77 DEG, ANB VS ANT LINED

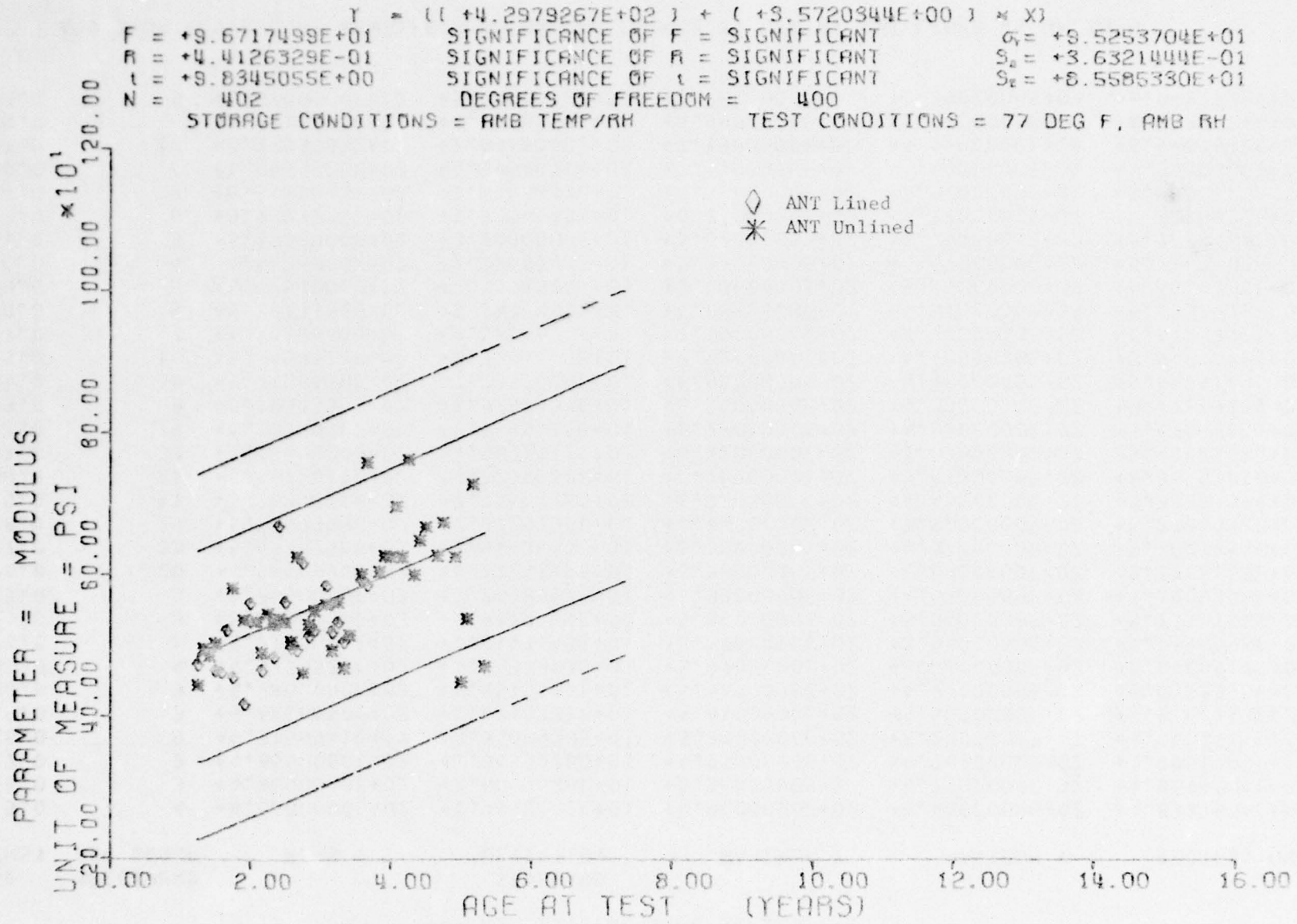
Figure 4-14

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
15.0	9	+4.4711108E+02	+2.3829836E+01	+4.9000000E+02	+4.2300000E+02	+4.5575488E+02
16.0	15	+4.8139990E+02	+6.0310861E+01	+5.7600000E+02	+3.6600000E+02	+4.5941967E+02
17.0	4	+4.0725000E+02	+6.4649697E+01	+5.0200000E+02	+3.6400000E+02	+4.6308422E+02
18.0	22	+4.4022705E+02	+6.8050353E+01	+5.5600000E+02	+3.3100000E+02	+4.6674902E+02
19.0	10	+4.3019995E+02	+4.3307171E+01	+4.8100000E+02	+3.5800000E+02	+4.7041357E+02
20.0	9	+4.7333325E+02	+9.6961332E+01	+6.5500000E+02	+3.5600000E+02	+4.7407836E+02
21.0	12	+5.0791650E+02	+9.7679865E+01	+6.2900000E+02	+3.5600000E+02	+4.7774316E+02
22.0	12	+4.7900000E+02	+7.1018563E+01	+5.7000000E+02	+3.7200000E+02	+4.8140771E+02
23.0	12	+4.3783325E+02	+5.2990279E+01	+5.2900000E+02	+3.6200000E+02	+4.8507250E+02
24.0	3	+5.6000000E+02	+7.9372539E+00	+5.6900000E+02	+5.5400000E+02	+4.8873706E+02
26.0	3	+4.6566650E+02	+2.0816659E+00	+4.6800000E+02	+4.6400000E+02	+4.9606665E+02
28.0	9	+5.1877758E+02	+4.2713515E+01	+5.8000000E+02	+4.7500000E+02	+5.0339599E+02
29.0	3	+6.6966650E+02	+2.4765748E+01	+6.9200000E+02	+6.4300000E+02	+5.0706054E+02
30.0	12	+5.5650000E+02	+1.2169148E+02	+6.7600000E+02	+4.2300000E+02	+5.1072534E+02
31.0	3	+4.9700000E+02	+1.7058722E+01	+5.1600000E+02	+4.8300000E+02	+5.1438989E+02
32.0	9	+5.3600000E+02	+4.7924419E+01	+6.1100000E+02	+4.8200000E+02	+5.1805468E+02
33.0	9	+5.2788867E+02	+9.6610615E+01	+6.2500000E+02	+3.8300000E+02	+5.2171948E+02
34.0	3	+5.1333325E+02	+4.0216083E+01	+5.5800000E+02	+4.8000000E+02	+5.2538403E+02
35.0	6	+5.4916650E+02	+4.9300777E+01	+6.4100000E+02	+5.0100000E+02	+5.2904882E+02
36.0	3	+5.7733325E+02	+1.3576941E+01	+5.9300000E+02	+5.6900000E+02	+5.3271337E+02
37.0	3	+5.8533325E+02	+3.4268547E+01	+6.2300000E+02	+5.5600000E+02	+5.3637817E+02
38.0	6	+5.1950000E+02	+6.3597955E+01	+5.8600000E+02	+4.5700000E+02	+5.4004272E+02
39.0	3	+5.3333325E+02	+8.0208062E+00	+5.4100000E+02	+5.2500000E+02	+5.4370751E+02
40.0	3	+5.0533325E+02	+2.4906491E+01	+5.3400000E+02	+4.8900000E+02	+5.4737231E+02
43.0	3	+5.9200000E+02	+1.3453624E+01	+6.0300000E+02	+5.7700000E+02	+5.5836621E+02
44.0	3	+5.8633325E+02	+6.6583281E+00	+5.9400000E+02	+5.8200000E+02	+5.6203100E+02
50.0	3	+5.9333325E+02	+1.2662279E+01	+6.0700000E+02	+5.8200000E+02	+5.8401904E+02
53.0	3	+5.0566650E+02	+2.7300793E+01	+5.3700000E+02	+4.8700000E+02	+5.9501318E+02
55.0	3	+5.1766650E+02	+1.3051181E+01	+5.2800000E+02	+5.0300000E+02	+6.0234252E+02
56.0	3	+5.9600000E+02	+2.7784887E+01	+6.1400000E+02	+5.6400000E+02	+6.0600732E+02

ANB 3066 PROPELLANT TENSILE MODULUS CHS 0.0002 IN/MIN, 77 DEG, ANB VS ANT LINED



AN8 3066 PROPELLANT TENSILE MODULUS CHS 0.0002 77 DEG F, ANT LINED VS UNLINED

Figure 4-15

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
15.0	4	+4.6600000E+02	+1.9442222E+01	+4.9000000E+02	+4.440C000E+02	+4.8337304E+02
16.0	3	+4.9600000E+02	+2.6057628E+01	+5.2600000E+02	+4.7900000E+02	+4.8694506E+02
17.0	2	+4.8550000E+02	+1.3435028E+01	+4.9500000E+02	+4.760C000E+02	+4.9051708E+02
18.0	9	+4.7755541E+02	+4.3508939E+01	+5.3900000E+02	+4.290C000E+02	+4.9408911E+02
19.0	3	+4.6266650E+02	+1.6258331E+01	+4.8100000E+02	+4.5000000E+02	+4.9766113E+02
20.0	3	+5.2200000E+02	+2.4515301E+01	+5.4600000E+02	+4.9700000E+02	+5.0123315E+02
21.0	9	+4.9733325E+02	+9.6437803E+01	+5.9700000E+02	+3.560C000E+02	+5.0480517E+02
23.0	6	+4.7700000E+02	+7.0447143E+01	+5.6700000E+02	+3.980C000E+02	+5.1194946E+02
24.0	3	+5.6000000E+02	+7.9372539E+00	+5.6900000E+02	+5.540C000E+02	+5.1552148E+02
25.0	3	+5.3400000E+02	+5.2373657E+01	+5.9300000E+02	+4.930C000E+02	+5.1909350E+02
26.0	20	+4.8644995E+02	+6.7014118E+01	+6.5200000E+02	+4.080C000E+02	+5.2266552E+02
27.0	33	+5.4575756E+02	+7.9142683E+01	+6.6000000E+02	+4.0300000E+02	+5.2623754E+02
28.0	25	+5.2547998E+02	+7.2329754E+01	+6.8600000E+02	+3.920C000E+02	+5.2980957E+02
29.0	11	+5.7427270E+02	+7.7966776E+01	+6.9200000E+02	+4.450C000E+02	+5.3338159E+02
30.0	21	+5.4171411E+02	+9.8284862E+01	+6.7600000E+02	+3.8100000E+02	+5.3695361E+02
31.0	33	+5.0500000E+02	+4.9822811E+01	+6.2200000E+02	+3.8200000E+02	+5.4052563E+02
32.0	25	+6.1047998E+02	+7.5596582E+01	+8.2200000E+02	+4.820C000E+02	+5.4409765E+02
33.0	8	+5.2037500E+02	+8.3237933E+01	+6.2500000E+02	+4.3300000E+02	+5.4766967E+02
34.0	18	+5.2766650E+02	+7.2352060E+01	+6.8000000E+02	+4.4400000E+02	+5.5124169E+02
35.0	14	+5.4407128E+02	+8.3354169E+01	+7.8200000E+02	+4.400C000E+02	+5.5481372E+02
37.0	7	+5.7042846E+02	+9.5874670E+01	+7.5500000E+02	+4.770C000E+02	+5.6195776E+02
38.0	9	+5.1077758E+02	+5.2377900E+01	+5.8600000E+02	+4.570C000E+02	+5.6552978E+02
39.0	6	+5.4750000E+02	+2.5351528E+01	+5.9700000E+02	+5.250C000E+02	+5.6910180E+02
40.0	4	+4.9625000E+02	+2.7268724E+01	+5.3400000E+02	+4.690C000E+02	+5.7267382E+02
41.0	8	+5.1500000E+02	+3.2000000E+01	+5.6200000E+02	+4.7900000E+02	+5.7624584E+02
43.0	6	+5.9683325E+02	+1.7394443E+01	+6.2100000E+02	+5.770C000E+02	+5.8339013E+02
44.0	7	+6.8542846E+02	+1.3505413E+02	+9.2800000E+02	+5.820C000E+02	+5.8696215E+02
46.0	6	+6.0433325E+02	+1.3954019E+02	+7.4700000E+02	+4.420C000E+02	+5.9410620E+02
47.0	10	+6.2759985E+02	+1.0916368E+02	+7.5300000E+02	+4.650C000E+02	+5.9767822E+02
48.0	6	+6.2616650E+02	+4.2976350E+01	+6.9600000E+02	+5.810C000E+02	+6.0125024E+02
49.0	5	+6.9700000E+02	+5.7480431E+01	+7.7000000E+02	+6.390C000E+02	+6.0482226E+02

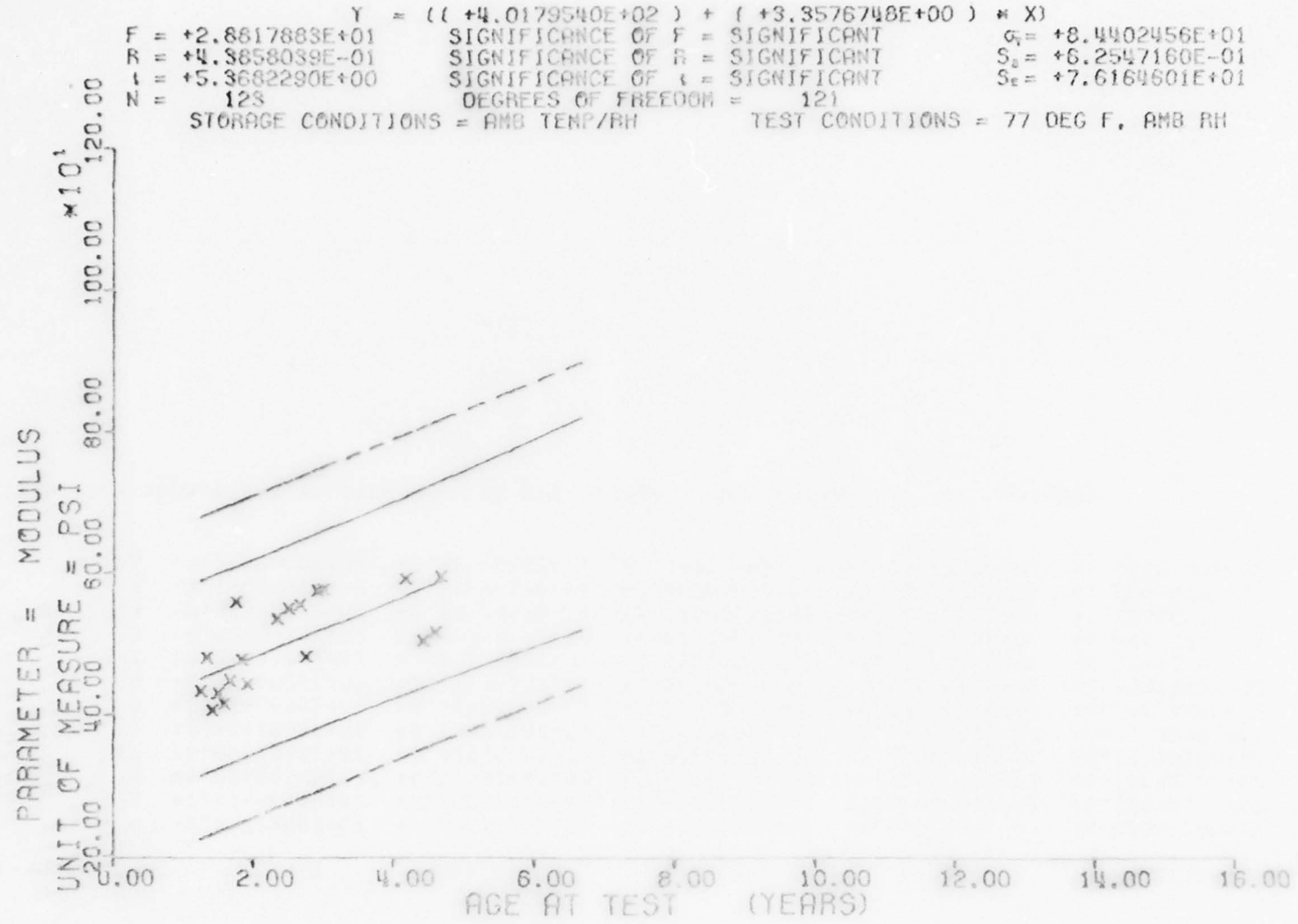
ANB 3066 PROPELLANT TENSILE MODULUS CHS 0.0002 77 DEG F. ANT LINED VS UNLINED

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
50.0	9	+6.2577758E+02	+5.0751299E+01	+6.9700000E+02	+5.4300000E+02	+6.0839428E+02
51.0	3	+7.6366650E+02	+5.5075705E+00	+7.6900000E+02	+7.5800000E+02	+6.1156630E+02
52.0	3	+6.0066650E+02	+9.7125348E+00	+6.0900000E+02	+5.9000000E+02	+6.1553833E+02
53.0	17	+6.4911743E+02	+9.6211929E+01	+7.9300000E+02	+5.0900000E+02	+6.1911035E+02
54.0	7	+6.6842846E+02	+8.7089718E+01	+7.7000000E+02	+5.5200000E+02	+6.2268237E+02
56.0	9	+6.2766650E+02	+8.5290679E+01	+7.6600000E+02	+5.2700000E+02	+6.2982641E+02
57.0	9	+6.7500000E+02	+6.1777827E+01	+7.6000000E+02	+5.9500000E+02	+6.3339843E+02
59.0	3	+6.2633325E+02	+2.1962088E+01	+6.4000000E+02	+6.0100000E+02	+6.4054248E+02
60.0	3	+4.4900000E+02	+8.1853527E+00	+4.5600000E+02	+4.4000000E+02	+6.4411474E+02
61.0	3	+5.3833325E+02	+1.2342339E+01	+5.5200000E+02	+5.2800000E+02	+6.4768676E+02
62.0	3	+7.2900000E+02	+1.1269427E+01	+7.3600000E+02	+7.1600000E+02	+6.5125878E+02
64.0	6	+4.7100000E+02	+3.5899860E+01	+4.9900000E+02	+4.2400000E+02	+6.5840283E+02

ANB 3066 PROPELLANT TENSILE MODULUS CHS 0.0002 77 DEG F, ANT LINED VS UNLINED



AMB 3066 PROPELLANT (AMB), TENSILE MODULUS, 0.0002 IN/MIN, 77 DEG F, LINED CTNS

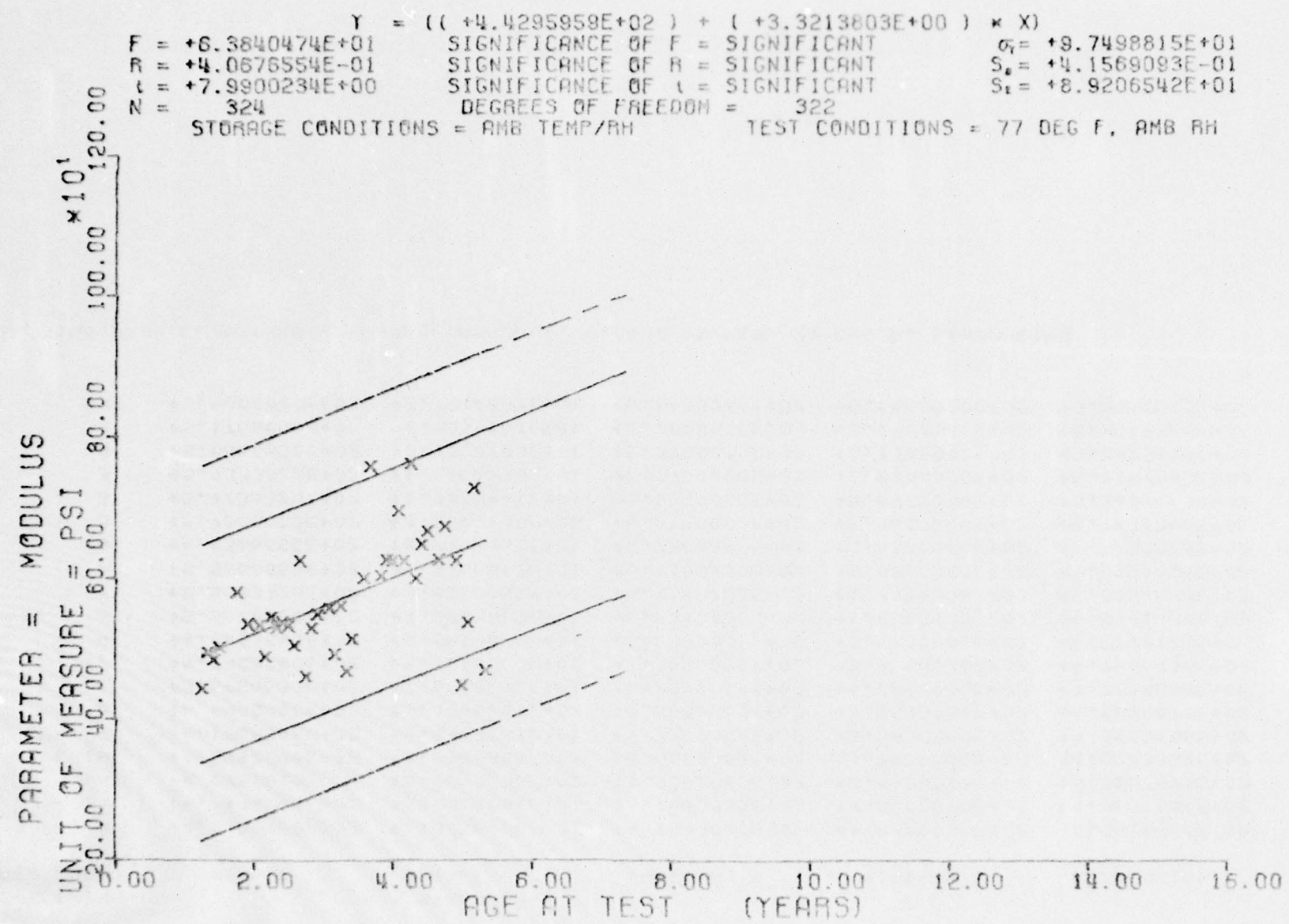
Figure 4-16

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
15.0	6	+4.3400000E+02	+1.3856406E+01	+4.5900000E+02	+4.2300000E+02	+4.5210040E+02
16.0	15	+4.8139990E+02	+6.0310861E+01	+5.7600000E+02	+3.6600000E+02	+4.5551806E+02
17.0	4	+4.0725000E+02	+6.4649697E+01	+5.0200000E+02	+3.6400000E+02	+4.5887573E+02
18.0	16	+4.3087500E+02	+7.5185880E+01	+5.5600000E+02	+3.3100000E+02	+4.6223339E+02
19.0	7	+4.1628564E+02	+4.4409887E+01	+4.7200000E+02	+3.5800000E+02	+4.6559106E+02
20.0	6	+4.4900000E+02	+1.1256287E+02	+6.5500000E+02	+3.5600000E+02	+4.6894873E+02
21.0	6	+5.6050000E+02	+7.6808202E+01	+6.2900000E+02	+4.4400000E+02	+4.7230639E+02
22.0	12	+4.7900000E+02	+7.1018563E+01	+5.7000000E+02	+3.7200000E+02	+4.7566406E+02
23.0	9	+4.4466653E+02	+5.8819639E+01	+5.2900000E+02	+3.6200000E+02	+4.7902172E+02
28.0	6	+5.3600000E+02	+4.2703629E+01	+5.8000000E+02	+4.8500000E+02	+4.9581030E+02
30.0	6	+5.5083325E+02	+1.3210059E+02	+6.7500000E+02	+4.2300000E+02	+5.0252563E+02
32.0	6	+5.5666650E+02	+4.5266617E+01	+6.1100000E+02	+5.0800000E+02	+5.0924096E+02
33.0	6	+4.8316650E+02	+8.7793887E+01	+5.7300000E+02	+3.8300000E+02	+5.1259863E+02
35.0	3	+5.7600000E+02	+5.8549130E+01	+6.4100000E+02	+5.2600000E+02	+5.1931396E+02
36.0	3	+5.7733325E+02	+1.3576941E+01	+5.9300000E+02	+5.6900000E+02	+5.2267163E+02
50.0	3	+5.9333325E+02	+1.2662279E+01	+6.0700000E+02	+5.8200000E+02	+5.6967895E+02
53.0	3	+5.0566650E+02	+2.7300793E+01	+5.3700000E+02	+4.8700000E+02	+5.7975195E+02
55.0	3	+5.1766650E+02	+1.3051181E+01	+5.2800000E+02	+5.0300000E+02	+5.8646728E+02
56.0	3	+5.9600000E+02	+2.7784887E+01	+6.1400000E+02	+5.6400000E+02	+5.8982519E+02

ANB 3066 PROPELLANT(ANB), TENSILE MODULUS, 0.0002 IN/MIN, 77 DEG F, LINED CTNS



ANB 3066 PROPELLANT(ANT) TENSILE MODULUS, 0.0002 IN/MIN, 77 DEG F, UNLINED CTNS

Figure 4-17

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
15.0	1	+4.4400000E+02	+0.0000000E+01	+4.4400000E+02	+4.4400000E+02	+4.9278027E+02
16.0	3	+4.9600000E+02	+2.6057628E+01	+5.2600000E+02	+4.7900000E+02	+4.9610156E+02
17.0	2	+4.8550000E+02	+1.3435028E+01	+4.9500000E+02	+4.7600000E+02	+4.9942285E+02
18.0	3	+5.0233325E+02	+5.0292477E+01	+5.3900000E+02	+4.4500000E+02	+5.0274438E+02
21.0	3	+5.8133325E+02	+1.3650396E+01	+5.9700000E+02	+5.7200000E+02	+5.1270849E+02
23.0	3	+5.3666650E+02	+3.1021497E+01	+5.6700000E+02	+5.0500000E+02	+5.1935131E+02
25.0	2	+5.7400000E+02	+5.2373657E+01	+5.9300000E+02	+4.9300000E+02	+5.2599389E+02
26.0	17	+4.9011743E+02	+7.2367881E+01	+6.5200000E+02	+4.0800000E+02	+5.2931542E+02
27.0	33	+5.4575756E+02	+7.5142683E+01	+6.6000000E+02	+4.0300000E+02	+5.3263671E+02
28.0	22	+5.3109082E+02	+7.5481886E+01	+6.8600000E+02	+3.9200000E+02	+5.3595800E+02
29.0	8	+5.3850000E+02	+5.6089214E+01	+5.9700000E+02	+4.4500000E+02	+5.3927954E+02
30.0	15	+5.3353320E+02	+9.0406120E+01	+6.4100000E+02	+3.8100000E+02	+5.4260083E+02
31.0	30	+5.0579980E+02	+5.2074482E+01	+6.2200000E+02	+3.9200000E+02	+5.4592236E+02
32.0	22	+5.2627270E+02	+6.5824573E+01	+6.2200000E+02	+5.3800000E+02	+5.4924365E+02
33.0	5	+4.6219995E+02	+2.5490349E+01	+4.9800000E+02	+4.3300000E+02	+5.5256494E+02
34.0	15	+5.3053320E+02	+7.7927499E+01	+6.8000000E+02	+4.4400000E+02	+5.5588647E+02
35.0	11	+5.5000000E+02	+9.3614101E+01	+7.8200000E+02	+4.4000000E+02	+5.5920776E+02
37.0	4	+5.5925000E+02	+1.2119546E+02	+7.5500000E+02	+4.7700000E+02	+5.6585038E+02
38.0	3	+4.9333325E+02	+1.3316656E+01	+5.0800000E+02	+4.8200000E+02	+5.6917187E+02
39.0	3	+5.6166650E+02	+3.0664855E+01	+5.9700000E+02	+5.4200000E+02	+5.7249340E+02
40.0	1	+4.6900000E+02	+0.0000000E+01	+4.6900000E+02	+4.6900000E+02	+5.7581469E+02
41.0	8	+5.1500000E+02	+3.2000000E+01	+5.6200000E+02	+4.7900000E+02	+5.7913598E+02
43.0	3	+6.0166650E+02	+2.2479620E+01	+6.2100000E+02	+5.7700000E+02	+5.8577580E+02
44.0	4	+7.5975000E+02	+1.3879811E+02	+9.2800000E+02	+6.3900000E+02	+5.8910009E+02
46.0	6	+6.0433325E+02	+1.3954019E+02	+7.4700000E+02	+4.4200000E+02	+5.9574291E+02
47.0	10	+6.2759985E+02	+1.0916368E+02	+7.5300000E+02	+4.6500000E+02	+5.9906445E+02
48.0	6	+6.2616650E+02	+4.2576350E+01	+6.9600000E+02	+5.8100000E+02	+6.0238574E+02
49.0	5	+6.3700000E+02	+5.7480431E+01	+7.1000000E+02	+6.3900000E+02	+6.0570703E+02
50.0	9	+6.2577758E+02	+5.0751299E+01	+6.9700000E+02	+5.4300000E+02	+6.0902856E+02
51.0	3	+7.0366650E+02	+5.5075705E+00	+7.0900000E+02	+7.5800000E+02	+6.1234985E+02
52.0	3	+6.0066650E+02	+9.7125348E+00	+6.0900000E+02	+5.9000000E+02	+6.1567114E+02

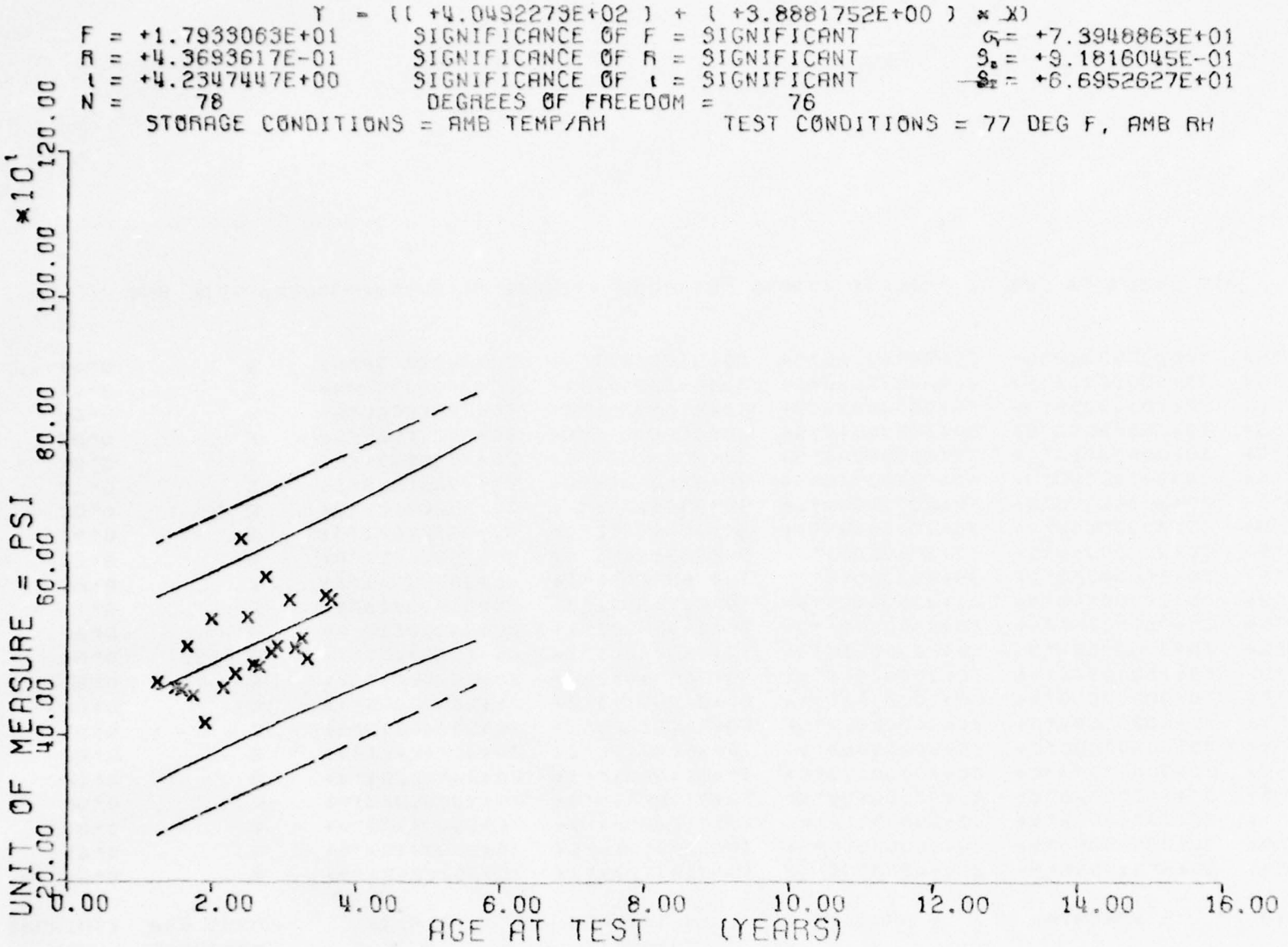
ANB 3066 PROPELLANT(ANT) TENSILE MODULUS, 0.0002 IN/MIN, 77 DEG F, UNLINED CTNS

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
53.0	17	+6.4911743E+02	+9.6211929E+01	+7.9300000E+02	+5.0900000E+02	+6.1899267E+02
54.0	7	+6.6842846E+02	+8.7089718E+01	+7.7000000E+02	+5.5200000E+02	+6.2231396E+02
56.0	9	+6.2766650E+02	+8.5290679E+01	+7.6600000E+02	+5.2700000E+02	+6.2895678E+02
57.0	9	+6.7500000E+02	+6.1777827E+01	+7.8000000E+02	+5.9500000E+02	+6.3227807E+02
59.0	3	+6.2633325E+02	+2.1962088E+01	+6.4000000E+02	+6.0100000E+02	+6.3892089E+02
60.0	3	+4.4900000E+02	+8.1853527E+00	+4.5600000E+02	+4.4000000E+02	+6.4224218E+02
61.0	3	+5.3833325E+02	+1.2342339E+01	+5.5200000E+02	+5.2800000E+02	+6.4556372E+02
62.0	3	+7.2900000E+02	+1.1269427E+01	+7.3600000E+02	+7.1600000E+02	+6.4888500E+02
64.0	6	+4.7100000E+02	+3.5899860E+01	+4.9900000E+02	+4.2400000E+02	+6.5552783E+02

ANB 3066 PROPELLANT(ANT) TENSILE MODULUS, 0.0002 IN/MIN, 77 DEG F, UNLINED CTNS



ANB 3066 PROPELLANT(ANT), TENSILE MODULUS, 0.0002 IN/MIN, 77 DEG F, LINED CIN

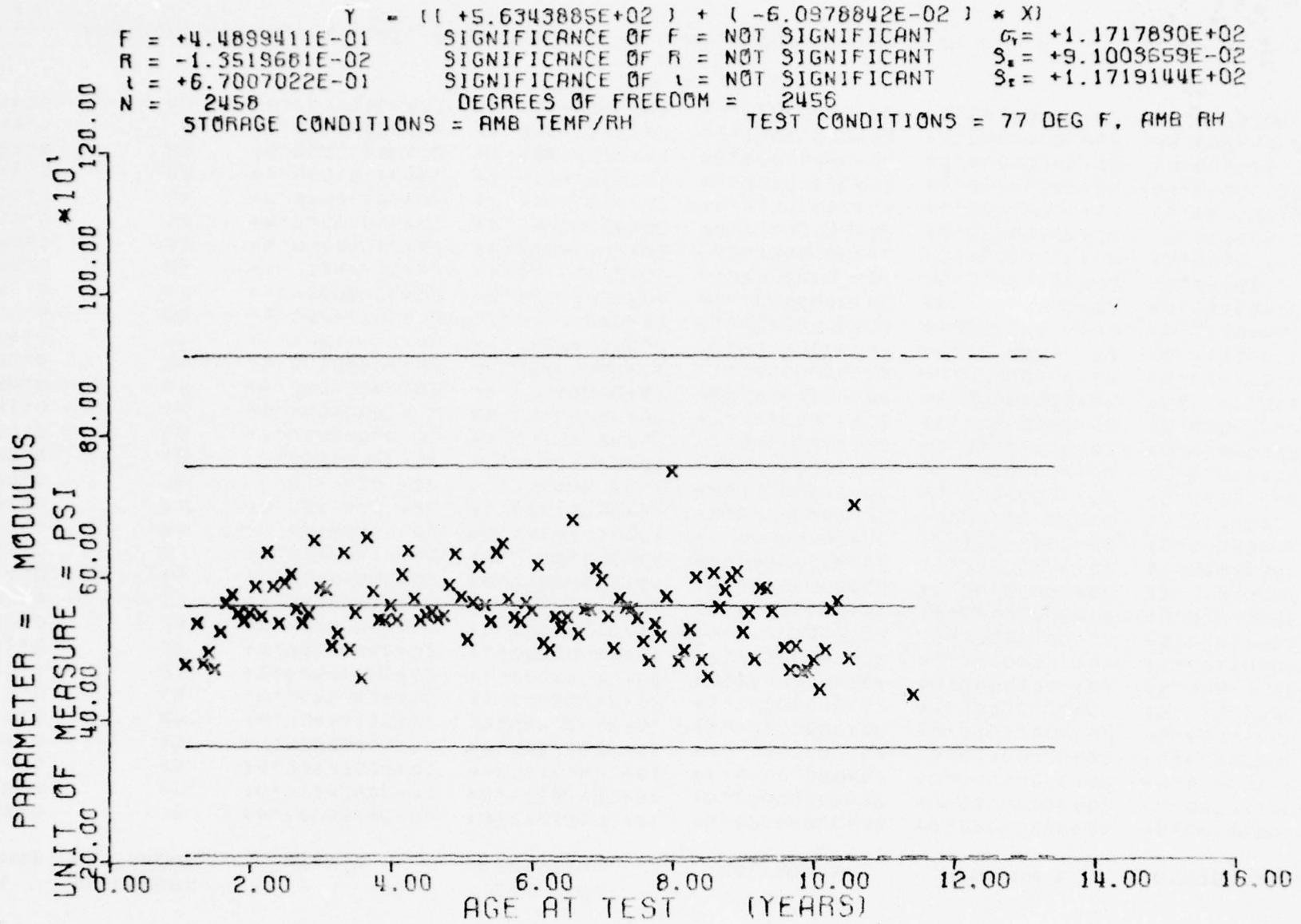
Figure 4-18

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
15.0	3	+4.7333325E+02	+1.5631165E+01	+4.9000000E+02	+4.5500000E+02	+4.6324536E+02
18.0	6	+4.6516650E+02	+3.8269657E+01	+5.0500000E+02	+4.2900000E+02	+4.7490966E+02
19.0	3	+4.6266650E+02	+1.6258331E+01	+4.8100000E+02	+4.5000000E+02	+4.7879785E+02
20.0	3	+5.2200000E+02	+2.4515301E+01	+5.4600000E+02	+4.9700000E+02	+4.8268603E+02
21.0	6	+4.5533325E+02	+9.1953611E+01	+5.6600000E+02	+3.5600000E+02	+4.8657421E+02
23.0	3	+4.1733325E+02	+2.7646579E+01	+4.4900000E+02	+3.9800000E+02	+4.9435058E+02
24.0	3	+5.6000000E+02	+7.9372539E+00	+5.6900000E+02	+5.5400000E+02	+4.9823876E+02
26.0	3	+4.6566650E+02	+2.0816659E+00	+4.6800000E+02	+4.6400000E+02	+5.0601513E+02
28.0	3	+4.8433325E+02	+8.3266639E+00	+4.9100000E+02	+4.7500000E+02	+5.1379150E+02
29.0	3	+6.6966650E+02	+2.4785748E+01	+6.9200000E+02	+6.4300000E+02	+5.1767968E+02
30.0	6	+5.6216650E+02	+1.2268564E+02	+6.7600000E+02	+4.3900000E+02	+5.2156787E+02
31.0	3	+4.9700000E+02	+1.7058722E+01	+5.1600000E+02	+4.8300000E+02	+5.2545605E+02
32.0	3	+4.9466650E+02	+1.4843629E+01	+5.1100000E+02	+4.8200000E+02	+5.2934423E+02
33.0	3	+6.1733325E+02	+8.0208062E+00	+6.2500000E+02	+6.0900000E+02	+5.3323242E+02
34.0	3	+5.1333325E+02	+4.0216083E+01	+5.5800000E+02	+4.8000000E+02	+5.3712060E+02
35.0	3	+5.2233325E+02	+2.1007935E+01	+5.4300000E+02	+5.0100000E+02	+5.4100878E+02
37.0	3	+5.8533325E+02	+3.4268547E+01	+6.2300000E+02	+5.5600000E+02	+5.4878515E+02
38.0	6	+5.1950000E+02	+6.3597955E+01	+5.8600000E+02	+4.5700000E+02	+5.5267333E+02
39.0	3	+5.3333325E+02	+8.0208062E+00	+5.4100000E+02	+5.2500000E+02	+5.5656152E+02
40.0	3	+5.0533325E+02	+2.4506491E+01	+5.3400000E+02	+4.8500000E+02	+5.6044970E+02
43.0	3	+5.9200000E+02	+1.3453624E+01	+6.0300000E+02	+5.7700000E+02	+5.7211425E+02
44.0	3	+5.8633325E+02	+6.6583281E+00	+5.9400000E+02	+5.8200000E+02	+5.7600244E+02

ANB 3066 PROPELLANT(ANT), TENSILE MODULUS, 0.0002 IN/MIN, 77 DEG F, LINEC CTN



ANB 3066 PROPELLANT (ALL ANB) TENSILE MODULUS, .0002 IN/MIN, 77 DEG F

Figure 4-19

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
13.0	7	+4.7828564E+02	+3.2273385E+01	+5.1200000E+02	+4.3200000E+02	+5.6264599E+02
15.0	21	+5.3714282E+02	+8.5028398E+01	+6.7300000E+02	+4.2300000E+02	+5.6252416E+02
16.0	45	+4.7877758E+02	+6.2330092E+01	+6.2900000E+02	+3.4400000E+02	+5.6246313E+02
17.0	19	+4.9557885E+02	+8.5877377E+01	+7.1300000E+02	+3.6400000E+02	+5.6240209E+02
18.0	28	+4.7246411E+02	+9.5430208E+01	+7.1900000E+02	+3.3100000E+02	+5.6234106E+02
19.0	18	+5.2455541E+02	+1.0355971E+02	+6.7300000E+02	+3.5800000E+02	+5.6228002E+02
20.0	27	+5.6459252E+02	+1.0602911E+02	+8.1400000E+02	+3.5600000E+02	+5.6221923E+02
21.0	37	+5.7627026E+02	+8.0604882E+01	+7.8500000E+02	+4.4000000E+02	+5.6215820E+02
22.0	35	+5.5048559E+02	+9.6325847E+01	+7.6800000E+02	+3.7200000E+02	+5.6209716E+02
23.0	19	+5.3915771E+02	+1.1548317E+02	+7.0700000E+02	+3.6200000E+02	+5.6203613E+02
24.0	15	+5.5046655E+02	+6.1855669E+01	+6.6000000E+02	+4.6600000E+02	+5.6197534E+02
25.0	33	+5.8778784E+02	+7.2206629E+01	+7.0400000E+02	+4.3700000E+02	+5.6191430E+02
26.0	27	+5.4644433E+02	+6.9916066E+01	+6.7500000E+02	+4.1800000E+02	+5.6185327E+02
27.0	22	+6.3645434E+02	+6.6871395E+01	+7.6000000E+02	+5.2200000E+02	+5.6179223E+02
28.0	36	+5.8819433E+02	+6.5284353E+01	+6.9300000E+02	+3.8700000E+02	+5.6173144E+02
29.0	12	+5.3591650E+02	+7.6823588E+01	+6.2700000E+02	+4.0000000E+02	+5.6167041E+02
30.0	16	+5.9243750E+02	+1.0118957E+02	+7.3600000E+02	+4.2300000E+02	+5.6160937E+02
31.0	13	+6.0500000E+02	+6.8944422E+01	+7.3100000E+02	+5.1600000E+02	+5.6154833E+02
32.0	27	+5.5637036E+02	+4.7654063E+01	+6.3900000E+02	+4.8000000E+02	+5.6148730E+02
33.0	39	+5.3638452E+02	+8.9986436E+01	+7.3600000E+02	+3.8300000E+02	+5.6142651E+02
34.0	17	+5.4994116E+02	+1.0127960E+02	+6.9300000E+02	+4.0000000E+02	+5.6136547E+02
35.0	23	+6.5321728E+02	+1.9416557E+02	+1.3240000E+03	+5.1200000E+02	+5.6130444E+02
36.0	47	+5.8665942E+02	+7.9076263E+01	+7.4600000E+02	+4.1300000E+02	+5.6124340E+02
37.0	26	+5.8319213E+02	+1.0678427E+02	+7.7300000E+02	+4.2100000E+02	+5.6118261E+02
38.0	33	+5.0348461E+02	+6.7692374E+01	+6.6700000E+02	+3.9500000E+02	+5.6112158E+02
39.0	13	+5.2200000E+02	+1.5598931E+02	+8.7200000E+02	+3.8700000E+02	+5.6106054E+02
40.0	27	+6.3492578E+02	+2.1501054E+02	+1.2130000E+03	+4.6000000E+02	+5.6099951E+02
41.0	22	+4.9831811E+02	+4.6054198E+01	+5.6500000E+02	+4.0500000E+02	+5.6093872E+02
42.0	20	+5.5050000E+02	+4.4221333E+01	+6.4600000E+02	+4.6400000E+02	+5.6087768E+02
43.0	9	+4.5888867E+02	+1.3714722E+02	+7.1600000E+02	+3.3600000E+02	+5.6081665E+02
44.0	25	+6.5679980E+02	+1.1186226E+02	+9.6600000E+02	+4.5800000E+02	+5.6075561E+02

ANB 3066 PROPELLANT (ALL ANB) TENSILE MODULUS, .0002 IN/MIN, 77 DEG F

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
45.0	20	+5.8050000E+02	+8.4686729E+01	+7.5200000E+02	+4.5500000E+02	+5.6069458E+02
46.0	44	+5.3988623E+02	+5.1504301E+01	+6.4300000E+02	+4.4900000E+02	+5.6063378E+02
47.0	12	+5.3925000E+02	+3.9055031E+01	+5.7600000E+02	+4.7700000E+02	+5.6057275E+02
48.0	20	+5.6109985E+02	+1.1707617E+02	+9.7400000E+02	+4.7900000E+02	+5.6051171E+02
49.0	22	+5.4022705E+02	+1.0844657E+02	+8.0500000E+02	+4.1700000E+02	+5.6045068E+02
50.0	32	+6.0343750E+02	+1.3946833E+02	+9.4200000E+02	+4.0000000E+02	+5.6038989E+02
51.0	57	+6.3729809E+02	+1.9018627E+02	+1.3460000E+03	+4.3100000E+02	+5.6032885E+02
52.0	50	+5.7073999E+02	+6.2869742E+01	+6.9000000E+02	+4.5300000E+02	+5.6026782E+02
53.0	40	+5.3917480E+02	+6.0028577E+01	+7.1000000E+02	+4.1500000E+02	+5.6020678E+02
54.0	19	+5.4605249E+02	+6.1264883E+01	+6.7800000E+02	+4.5300000E+02	+5.6014599E+02
55.0	47	+5.5000000E+02	+9.2926104E+01	+8.5900000E+02	+4.1300000E+02	+5.6008496E+02
56.0	62	+5.4125805E+02	+8.6243067E+01	+8.4800000E+02	+3.9500000E+02	+5.6002392E+02
57.0	46	+5.4539111E+02	+8.9556308E+01	+7.3600000E+02	+4.1600000E+02	+5.5996289E+02
58.0	35	+5.8848559E+02	+1.0062375E+02	+8.7000000E+02	+4.5300000E+02	+5.5990185E+02
59.0	20	+6.3239990E+02	+8.2873016E+01	+7.6000000E+02	+5.2800000E+02	+5.5984106E+02
60.0	20	+5.7264990E+02	+4.4530622E+01	+6.4000000E+02	+4.7000000E+02	+5.5978002E+02
61.0	40	+5.1144995E+02	+1.1212674E+02	+6.7800000E+02	+1.9700000E+02	+5.5971899E+02
62.0	35	+5.6379980E+02	+9.7291194E+01	+9.4700000E+02	+4.0500000E+02	+5.5965795E+02
63.0	45	+6.1444433E+02	+1.5297969E+02	+1.5150000E+03	+4.4000000E+02	+5.5959716E+02
64.0	36	+5.6050000E+02	+9.1732063E+01	+7.8800000E+02	+3.6700000E+02	+5.5953613E+02
65.0	28	+5.3767846E+02	+7.6896781E+01	+6.7500000E+02	+3.9200000E+02	+5.5947509E+02
66.0	28	+6.3385693E+02	+1.2416169E+02	+8.9500000E+02	+4.5300000E+02	+5.5941406E+02
67.0	46	+6.4671728E+02	+1.4961196E+02	+9.4700000E+02	+4.2400000E+02	+5.5935327E+02
68.0	44	+5.6829541E+02	+1.2326065E+02	+9.6000000E+02	+3.6300000E+02	+5.5929223E+02
69.0	32	+5.4312500E+02	+5.3109594E+01	+6.7100000E+02	+4.5300000E+02	+5.5923120E+02
70.0	40	+5.3644995E+02	+8.4065587E+01	+8.0000000E+02	+4.2200000E+02	+5.5917016E+02
71.0	47	+5.6348925E+02	+1.3605032E+02	+1.0740000E+03	+3.8500000E+02	+5.5910913E+02
72.0	34	+5.5288232E+02	+7.7309203E+01	+7.6600000E+02	+4.1600000E+02	+5.5904833E+02
73.0	24	+6.1633325E+02	+1.1496384E+02	+9.7300000E+02	+4.8700000E+02	+5.5898730E+02
74.0	15	+5.0626660E+02	+9.7847889E+01	+6.7900000E+02	+3.7500000E+02	+5.5892626E+02
75.0	30	+4.9683325E+02	+8.8224276E+01	+7.2000000E+02	+3.7300000E+02	+5.5886523E+02

ANB 3066 PROPELLANT (ALL ANB) TENSILE MODULUS, .0002 IN/MIN, 77 DEG F

****** LINEAR REGRESSION ANALYSIS ******

***** ANALYSIS OF TIME SERIES *****

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
76.0	17	+5.4347045E+02	+7.1110932E+01	+6.9200000E+02	+4.5300000E+02	+5.5880444E+02
77.0	19	+5.2726293E+02	+8.0067917E+01	+6.4000000E+02	+4.1300000E+02	+5.5874340E+02
78.0	24	+5.4291650E+02	+7.3757485E+01	+6.5700000E+02	+4.3500000E+02	+5.5868237E+02
79.0	17	+6.8005859E+02	+1.3534099E+02	+9.3300000E+02	+4.0900000E+02	+5.5862133E+02
80.0	33	+5.1906054E+02	+8.8404588E+01	+7.6100000E+02	+3.8200000E+02	+5.5856054E+02
81.0	26	+5.5326904E+02	+9.0964853E+01	+8.2900000E+02	+4.3200000E+02	+5.5849951E+02
82.0	15	+5.5346655E+02	+6.8312168E+01	+6.8000000E+02	+4.6600000E+02	+5.5843847E+02
83.0	33	+6.1181811E+02	+2.5071017E+02	+1.4150000E+03	+4.1600000E+02	+5.5837744E+02
84.0	42	+5.9507128E+02	+1.9119130E+02	+1.4100000E+03	+4.3700000E+02	+5.5831640E+02
85.0	15	+5.4393310E+02	+7.9652339E+01	+6.4000000E+02	+4.2000000E+02	+5.5825561E+02
86.0	22	+4.9886352E+02	+6.9374961E+01	+5.9500000E+02	+3.7800000E+02	+5.5819458E+02
87.0	23	+5.6952172E+02	+1.3228889E+02	+9.5200000E+02	+3.4400000E+02	+5.5813354E+02
88.0	32	+5.5665625E+02	+1.1172189E+02	+8.7100000E+02	+3.0200000E+02	+5.5807250E+02
89.0	30	+5.5523315E+02	+8.7574867E+01	+8.0000000E+02	+4.2200000E+02	+5.5801171E+02
90.0	11	+5.4127270E+02	+8.4657062E+01	+6.6200000E+02	+4.3500000E+02	+5.5795068E+02
91.0	9	+5.0911108E+02	+4.4798003E+01	+6.0600000E+02	+4.7100000E+02	+5.5788964E+02
92.0	17	+4.8129394E+02	+3.6726633E+01	+5.6700000E+02	+4.1300000E+02	+5.5782861E+02
93.0	15	+5.3326660E+02	+6.6359913E+01	+6.3200000E+02	+4.2000000E+02	+5.5776782E+02
94.0	12	+5.1500000E+02	+6.6160960E+01	+6.5900000E+02	+4.0100000E+02	+5.5770678E+02
95.0	24	+5.7100000E+02	+8.9004152E+01	+7.1200000E+02	+4.1700000E+02	+5.5764575E+02
96.0	11	+7.4645434E+02	+2.6197685E+02	+1.3200000E+03	+5.1400000E+02	+5.5758471E+02
97.0	6	+4.8000000E+02	+3.9278492E+01	+5.4200000E+02	+4.3900000E+02	+5.5752368E+02
98.0	9	+4.9488867E+02	+3.1150619E+01	+5.5200000E+02	+4.6200000E+02	+5.5746289E+02
99.0	5	+5.2379980E+02	+1.0263381E+02	+6.6800000E+02	+4.0900000E+02	+5.5740185E+02
100.0	2	+5.9800000E+02	+1.0182337E+02	+6.7000000E+02	+5.2600000E+02	+5.5734082E+02
101.0	9	+4.8244433E+02	+8.9005773E+01	+7.0800000E+02	+3.9600000E+02	+5.5727978E+02
102.0	3	+4.5833325E+02	+1.6165807E+01	+4.7300000E+02	+4.4100000E+02	+5.5721899E+02
103.0	2	+6.0400000E+02	+6.2225396E+01	+6.4800000E+02	+5.6000000E+02	+5.5715795E+02
104.0	7	+5.5557128E+02	+6.1272226E+01	+6.5100000E+02	+4.8300000E+02	+5.5709692E+02
105.0	9	+5.7944433E+02	+9.2818520E+01	+7.2900000E+02	+4.3700000E+02	+5.5703588E+02
106.0	11	+5.9772705E+02	+2.1147439E+02	+1.0280000E+03	+3.4200000E+02	+5.5697509E+02

ANB 3066 PROPELLANT (ALL ANB) TENSILE MODULUS, .0002 IN/MIN, 77 DEG F

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
107.0	2	+6.0550000E+02	+6.5760930E+01	+6.5200000E+02	+5.5900000E+02	+5.5691406E+02
108.0	3	+5.2066650E+02	+9.4516312E+00	+5.2800000E+02	+5.1000000E+02	+5.5685302E+02
109.0	14	+5.4771411E+02	+2.0508888E+02	+1.0540000E+03	+4.1700000E+02	+5.5679199E+02
110.0	11	+4.8254541E+02	+6.5477268E+01	+6.3200000E+02	+3.9400000E+02	+5.5673095E+02
111.0	5	+5.8319995E+02	+1.4635812E+02	+7.7600000E+02	+3.9200000E+02	+5.5667016E+02
112.0	6	+5.8150000E+02	+1.7607947E+02	+8.6900000E+02	+3.7900000E+02	+5.5660913E+02
113.0	18	+5.4961108E+02	+1.0997226E+02	+8.0900000E+02	+4.1900000E+02	+5.5654809E+02
115.0	6	+4.9883325E+02	+4.1004471E+01	+5.5600000E+02	+4.4300000E+02	+5.5642626E+02
116.0	6	+4.6700000E+02	+6.2555575E+01	+5.7500000E+02	+3.8800000E+02	+5.5636523E+02
117.0	3	+5.0066650E+02	+3.3080709E+01	+5.2500000E+02	+4.6300000E+02	+5.5630419E+02
118.0	4	+4.6525000E+02	+3.5415392E+01	+5.1800000E+02	+4.4200000E+02	+5.5624316E+02
119.0	9	+4.6666650E+02	+2.2901964E+01	+5.1000000E+02	+4.3800000E+02	+5.5618237E+02
120.0	2	+4.8100000E+02	+0.0000000E+99	+4.8100000E+02	+4.8100000E+02	+5.5612133E+02
121.0	3	+4.3966650E+02	+1.1239810E+01	+4.5200000E+02	+4.3000000E+02	+5.5606030E+02
122.0	3	+4.9500000E+02	+8.5854528E+01	+5.7600000E+02	+4.0500000E+02	+5.5599926E+02
123.0	9	+5.5244433E+02	+8.1083461E+01	+6.6900000E+02	+4.1700000E+02	+5.5593823E+02
124.0	6	+5.6416650E+02	+6.8527256E+01	+6.8500000E+02	+4.9400000E+02	+5.5587744E+02
126.0	6	+4.8300000E+02	+1.2559012E+02	+6.9200000E+02	+3.3800000E+02	+5.5575537E+02
127.0	3	+6.9866650E+02	+1.4910510E+02	+8.6500000E+02	+5.7700000E+02	+5.5569433E+02
137.0	1	+4.3200000E+02	+0.0000000E+27	+4.3200000E+02	+4.3200000E+02	+5.5508471E+02

ANB 3066 PROPELLANT (ALL ANB) TENSILE MODULUS, .0002 IN/MIN, 77 DEG F

SECTION V

HIGH RATE TRIAXIAL

This test uses a 3/4 inch (1.9cm) GL rail, 5 inches (12.7cm) long. The specimens are tested on the MTS at a crosshead speed of 1750 in/min (74.08cm/sec) with 600 psi (421 860 kg/sq m) nitrogen pressure. Strain rate is 1000 in/in/min. This test simulates the condition of the motor at stage ignition.

Only lined cartons of ANT show a significant decrease in strain at rupture (Figure 5-1). No other types of cartons show a significant change, although ANB lined and ANT unlined cartons have negative slopes and ANA and ANB unlined cartons have positive slopes.

Lined cartons of ANB and ANT show a significant increase in maximum stress (Figures 5-2 and 5-3). Unlined cartons of ANB and ANT also show a significant increase (Figures 5-4 and 5-5). ANA does not show a significant change. Composite lined and unlined cartons of ANB do not show a significant change.

Only ANA and ANB unlined cartons show significant decreases in modulus (Figures 5-6 and 5-7).

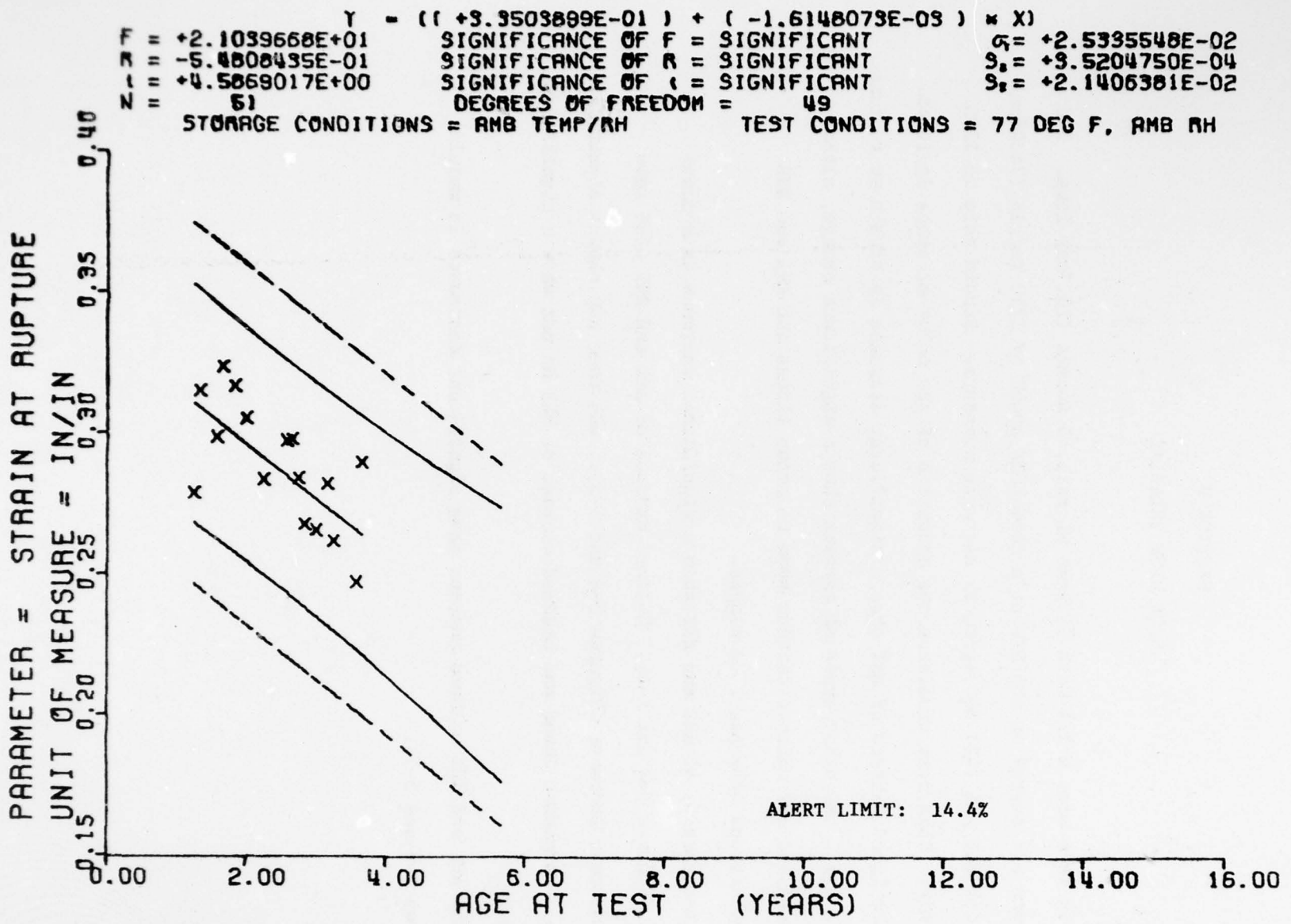

Y = ((+3.3503889E-01) + (-1.6148073E-03) * X)
F = +2.1039668E+01 SIGNIFICANCE OF F = SIGNIFICANT σ = +2.5335548E-02
R = -5.4808435E-01 SIGNIFICANCE OF R = SIGNIFICANT S_b = +3.5204750E-04
t = +4.5869017E+00 SIGNIFICANCE OF t = SIGNIFICANT S_a = +2.1406381E-02
N = 51 DEGREES OF FREEDOM = 49
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = 77 DEG F, AMB RH
PARAMETER = STRAIN AT RUPTURE
UNIT OF MEASURE = IN/IN
0.40
0.35
0.30
0.25
0.20
0.15
ALERT LIMIT: 14.4%
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
ANB 3066 PROPELLANT(ANT) TENSILE STN AT RUP, 1750 IN/MIN, 600 PSI, 77 DEG LINED

Figure 5-1

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
18.0	3	+2.7916657E-01	+1.6851599E-03	+2.8059995E-01	+2.7729994E-01	+3.1081688E-01
19.0	3	+3.1836652E-01	+2.3062295E-02	+3.4029996E-01	+2.9479998E-01	+3.0920207E-01
19.0	3	+2.9886662E-01	+1.3737878E-02	+3.1469994E-01	+2.9009997E-01	+3.0435764E-01
20.0	3	+3.2386660E-01	+4.2998195E-03	+3.2639998E-01	+3.1989998E-01	+3.0274283E-01
22.0	3	+3.1699997E-01	+2.6190794E-02	+3.4229999E-01	+2.8999996E-01	+2.9951322E-01
24.0	3	+3.0546659E-01	+2.3479935E-02	+3.2959997E-01	+2.8269994E-01	+2.9628360E-01
27.0	3	+2.8403294E-01	+2.0393668E-02	+3.1209999E-01	+2.5999999E-01	+2.9143917E-01
31.0	3	+2.9779994E-01	+1.3194786E-02	+3.1299996E-01	+2.8929996E-01	+2.8497993E-01
32.0	3	+2.9823327E-01	+2.2855772E-02	+3.1469994E-01	+2.7209997E-01	+2.8336513E-01
33.0	3	+2.8453332E-01	+1.8744433E-02	+3.0599999E-01	+2.7139997E-01	+2.8175032E-01
34.0	5	+2.8813983E-01	+1.9586370E-02	+2.9699999E-01	+2.4899995E-01	+2.8013551E-01
36.0	2	+2.8599997E-01	+7.0678377E-03	+2.7099996E-01	+2.6099997E-01	+2.7690589E-01
39.0	2	+2.8249996E-01	+1.3434832E-02	+2.9199999E-01	+2.7299994E-01	+2.7367627E-01
39.0	5	+2.6223963E-01	+1.6069810E-02	+2.8199994E-01	+2.4099999E-01	+2.7206146E-01
43.0	2	+2.4749994E-01	+2.8990595E-02	+2.6799994E-01	+2.2699999E-01	+2.6560223E-01
44.0	2	+2.8999996E-01	+1.4027190E-03	+2.9099994E-01	+2.8899997E-01	+2.6398742E-01

ANB 3066 PROPELLANT(ANT) TENSILE STN AT RUP, 1750 IN/MIN, 600 PSI, 77 DEG LINED

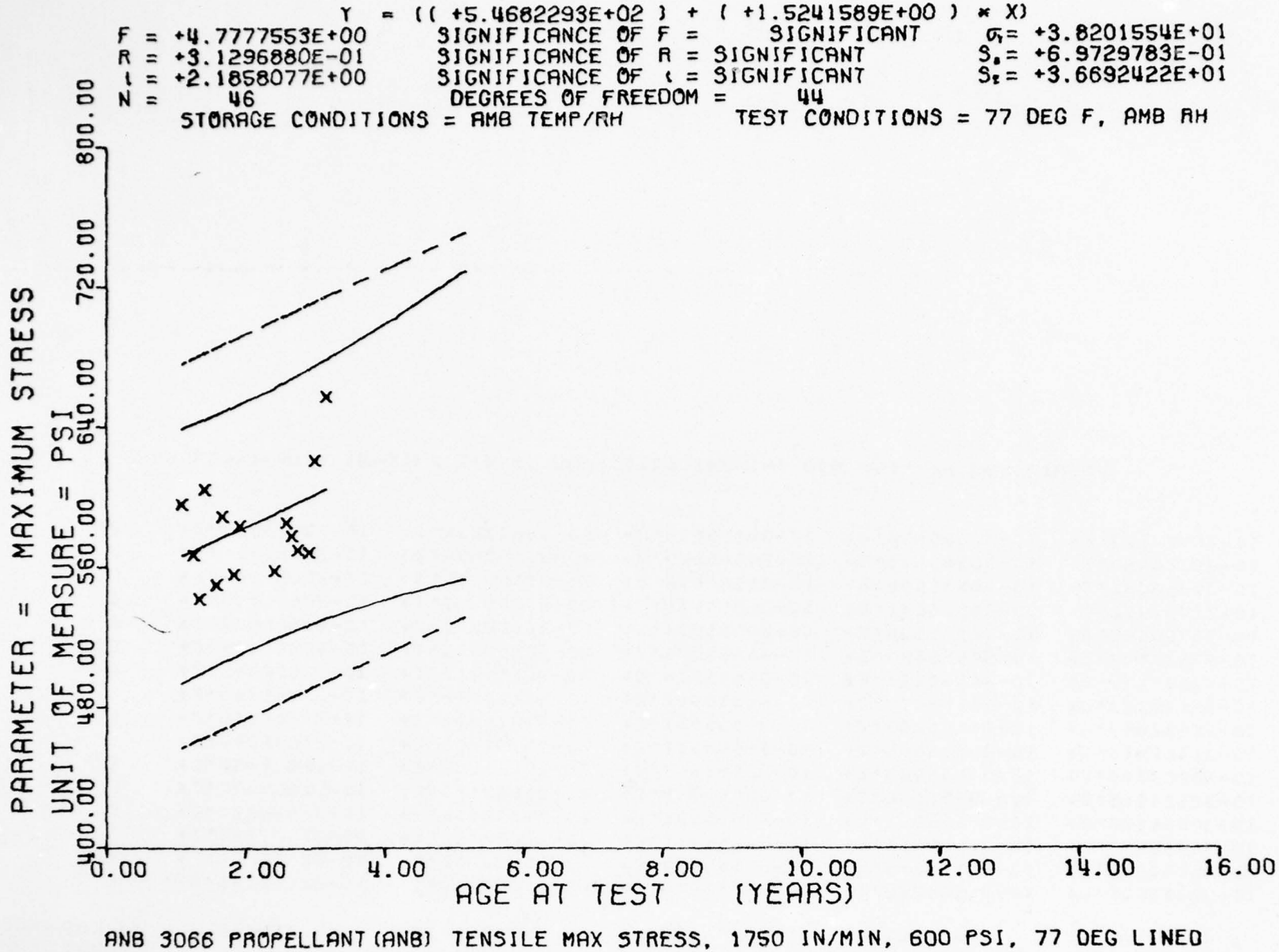

Y = ((+5.4682293E+02) + (+1.5241589E+00) * X)
F = +4.7777553E+00 SIGNIFICANCE OF F = SIGNIFICANT σ = +3.8201554E+01
R = +3.1296880E-01 SIGNIFICANCE OF R = SIGNIFICANT S = +6.9729783E-01
t = +2.1858077E+00 SIGNIFICANCE OF t = SIGNIFICANT S = +3.6692422E+01
N = 46 DEGREES OF FREEDOM = 44
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = 77 DEG F, AMB RH
PARAMETER = MAXIMUM STRESS
UNIT OF MEASURE = PSI
400.00
480.00
560.00
640.00
720.00
800.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
ANB 3066 PROPELLANT (ANB) TENSILE MAX STRESS, 1750 IN/MIN, 600 PSI, 77 DEG LINED

Figure 5-2

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
13.0	3	+5.963132E+02	+1.201221E+01	+6.051198E+02	+5.822288E+02	+5.866369E+02
15.0	2	+5.674348E+02	+6.703404E+00	+5.721699E+02	+5.626999E+02	+5.696853E+02
16.0	4	+5.421748E+02	+3.614505E+01	+5.787399E+02	+4.930000E+02	+5.712094E+02
17.0	6	+6.048513E+02	+2.141410E+01	+6.325197E+02	+5.688396E+02	+5.727333E+02
19.0	4	+5.502448E+02	+2.043949E+01	+5.776499E+02	+5.308599E+02	+5.757817E+02
20.0	4	+5.893122E+02	+2.728054E+01	+6.295698E+02	+5.692199E+02	+5.773059E+02
22.0	4	+5.561223E+02	+3.737028E+01	+5.930297E+02	+5.089199E+02	+5.803542E+02
23.0	4	+5.840622E+02	+5.115191E+01	+6.409199E+02	+5.220397E+02	+5.818784E+02
29.0	2	+5.582443E+02	+1.596514E+01	+5.695297E+02	+5.469559E+02	+5.910234E+02
31.0	2	+5.860297E+02	+2.715503E+01	+6.052299E+02	+5.668298E+02	+5.940717E+02
32.0	2	+5.754948E+02	+1.141769E+01	+5.865598E+02	+5.704299E+02	+5.955959E+02
33.0	2	+5.701599E+02	+1.308765E+01	+5.794099E+02	+5.609099E+02	+5.971201E+02
36.0	1	+5.686899E+02	+0.000000E+27	+5.686899E+02	+5.686899E+02	+6.016845E+02
36.0	4	+6.209372E+02	+4.034567E+01	+6.635097E+02	+5.705097E+02	+6.016926E+02
38.0	2	+6.574797E+02	+2.949210E+01	+6.783298E+02	+6.366298E+02	+6.047409E+02

ANB 3066 PROPELLANT(ANB) TENSILE MAX STRESS, 1750 IN/MIN, 600 PSI, 77 DEG LINED

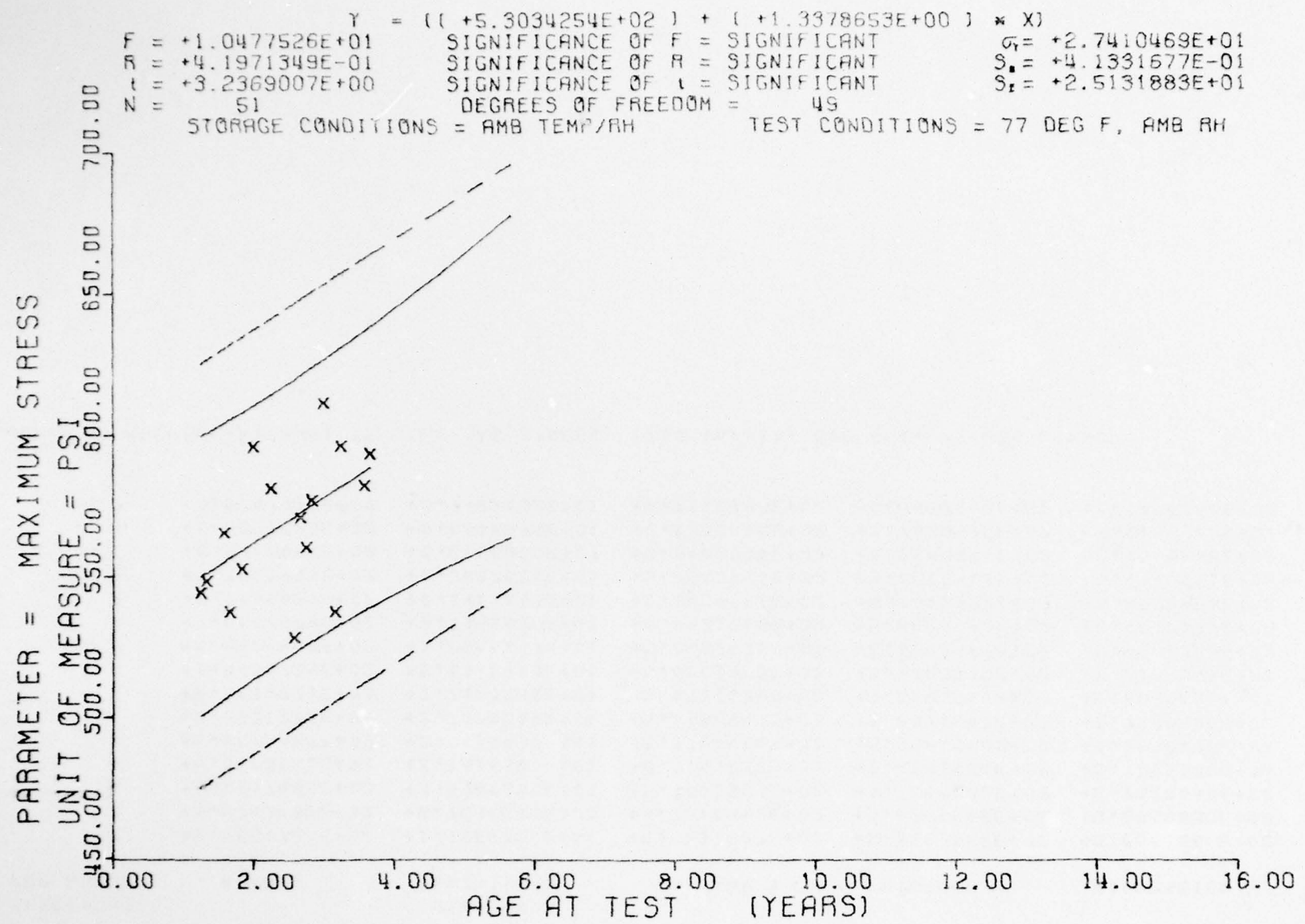

Y = ((+5.3034254E+02) + (+1.3378653E+00) * X)
F = +1.0477526E+01 SIGNIFICANCE OF F = SIGNIFICANT σ = +2.7410469E+01
R = +4.1971349E-01 SIGNIFICANCE OF R = SIGNIFICANT S = +4.1331677E-01
t = +3.2369007E+00 SIGNIFICANCE OF t = SIGNIFICANT S = +2.5131883E+01
N = 51 DEGREES OF FREEDOM = 49
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = 77 DEG F, AMB RH
PARAMETER = MAXIMUM STRESS
UNIT OF MEASURE = PSI
450.00
500.00
550.00
600.00
650.00
700.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
ANB 3066 PROPELLANT(ANT) TENSILE MAX STRESS, 1750 IN/MIN, 600 PSI, 77 DEG LINED

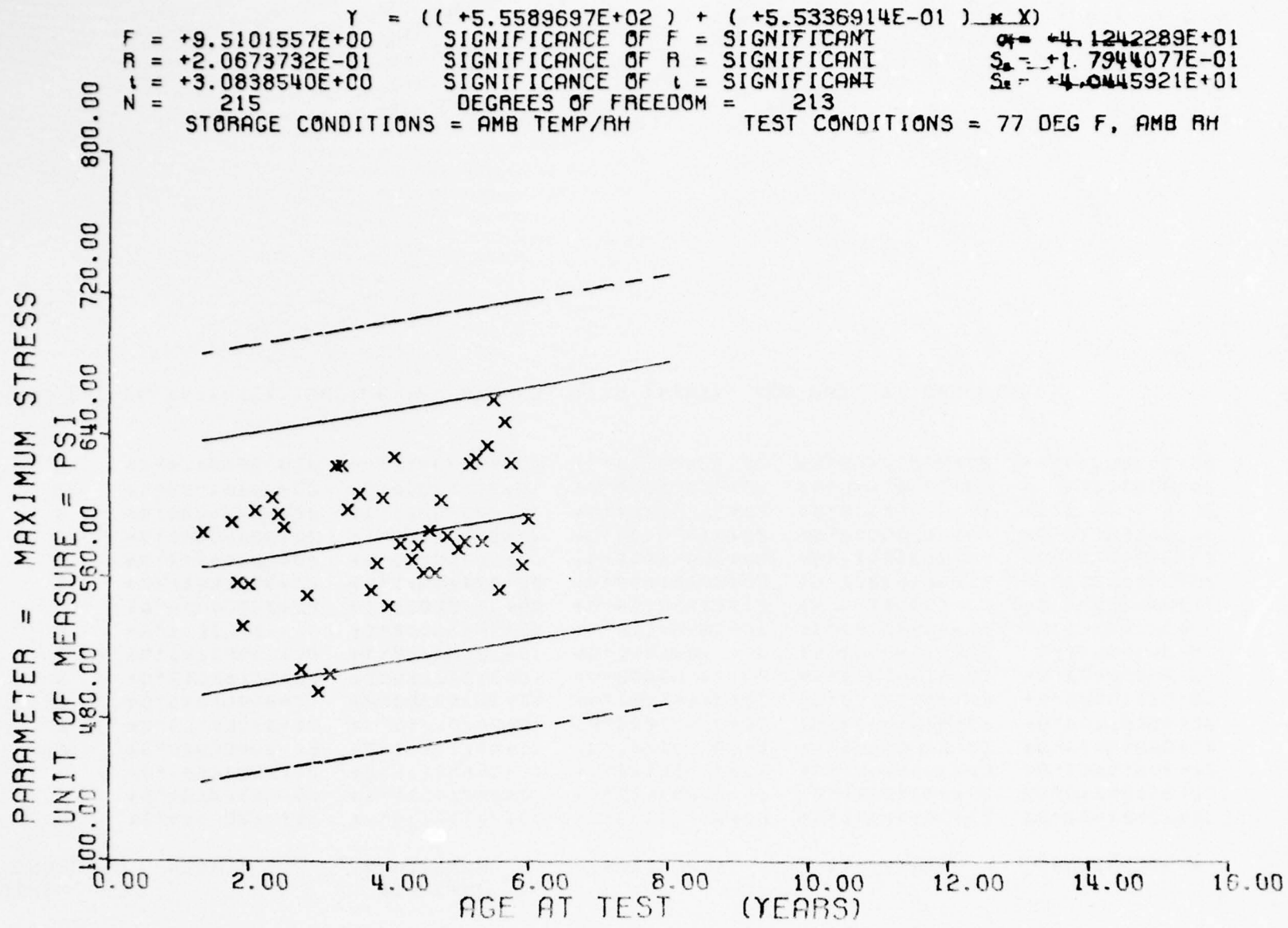
Figure 5-3

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
15.0	3	+5.4463989E+02	+6.1073618E+00	+5.5085586E+02	+5.3866552E+02	+5.5041040E+02
16.0	3	+5.4878320E+02	+7.4891723E+00	+5.5734985E+02	+5.4355581E+02	+5.5174829E+02
19.0	3	+5.6592651E+02	+2.5032994E+01	+5.6417993E+02	+5.3244555E+02	+5.5576196E+02
20.0	3	+5.3783300E+02	+2.2058211E+01	+5.5227978E+02	+5.1244955E+02	+5.5709585E+02
22.0	3	+5.5314306E+02	+5.4148675E+00	+5.5690951E+02	+5.4694955E+02	+5.5977539E+02
24.0	3	+5.5634985E+02	+2.5398610E+01	+5.8001977E+02	+5.6343594E+02	+5.6245117E+02
27.0	6	+5.8172973E+02	+2.5837751E+01	+6.2500976E+02	+5.6240991E+02	+5.6646484E+02
31.0	3	+5.2870654E+02	+1.2377888E+01	+5.3987988E+02	+5.1540951E+02	+5.7181616E+02
32.0	3	+5.7121313E+02	+9.3309994E+00	+5.8114990E+02	+5.6265951E+02	+5.7315405E+02
33.0	3	+5.6060302E+02	+7.2003380E+00	+5.6516952E+02	+5.5231982E+02	+5.7449194E+02
34.0	5	+5.7734375E+02	+8.1456716E+00	+5.8877978E+02	+5.7026977E+02	+5.7582983E+02
36.0	2	+6.1184472E+02	+6.0425493E+00	+6.1605585E+02	+6.0758984E+02	+5.7850561E+02
38.0	2	+5.3790478E+02	+1.2247308E+01	+5.4655581E+02	+5.2925000E+02	+5.8118139E+02
39.0	5	+5.9664770E+02	+1.6580908E+01	+6.1726577E+02	+5.8262588E+02	+5.8251928E+02
43.0	2	+5.8244970E+02	+3.2008095E+01	+6.0507983E+02	+5.5981982E+02	+5.8787060E+02
44.0	2	+5.9392968E+02	+6.5916655E+00	+5.9856582E+02	+5.8928579E+02	+5.8920849E+02

ANB 3066 PROPELLANT(ANT) TENSILE MAX STRESS, 1750 IN/MIN, 600 PSI, 77 DEG LINED



ANB 3066 PROPELLANT(ANB) TENSILE MAX STRESS, 1750 IN/MIN, 600 PSI, 77 DEG UNLND

Figure 5-4

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
15.0	8	+5.8472949E+02	+2.5755353E+01	+6.2000000E+02	+5.3979980E+02	+5.6475973E+02
21.0	2	+5.5085987E+02	+2.6774965E+01	+5.6979980E+02	+5.7193994E+02	+5.6751757E+02
22.0	2	+5.5638476E+02	+1.0820743E+01	+5.6402978E+02	+5.4873999E+02	+5.6807134E+02
23.0	2	+5.3182983E+02	+1.5388167E+01	+5.4270996E+02	+5.2094995E+02	+5.6862426E+02
24.0	2	+5.5563989E+02	+2.5738421E+01	+5.7457983E+02	+5.3669995E+02	+5.6917773E+02
25.0	2	+5.9723486E+02	+1.5529364E+01	+6.0820996E+02	+5.8625976E+02	+5.6973120E+02
28.0	6	+6.0484985E+02	+1.5906249E+01	+6.2038989E+02	+5.8370996E+02	+5.7139111E+02
29.0	2	+5.9525488E+02	+2.7530646E+01	+6.1471997E+02	+5.7578979E+02	+5.7194458E+02
30.0	4	+5.8786987E+02	+1.7224492E+01	+6.0767993E+02	+5.6721997E+02	+5.7249804E+02
33.0	2	+5.0750000E+02	+3.5355339E+00	+5.1000000E+02	+5.0500000E+02	+5.7415795E+02
34.0	6	+5.4916650E+02	+6.0861365E+01	+6.4500000E+02	+5.0500000E+02	+5.7471142E+02
36.0	2	+4.9500000E+02	+1.4142135E+01	+5.0500000E+02	+4.8500000E+02	+5.7581811E+02
38.0	1	+5.0500000E+02	+0.0000000E+79	+5.0500000E+02	+5.0500000E+02	+5.7692480E+02
39.0	4	+6.2250000E+02	+2.5000000E+01	+6.5000000E+02	+5.9000000E+02	+5.7747827E+02
40.0	2	+6.2294482E+02	+9.8393488E+00	+6.2989990E+02	+6.1598999E+02	+5.7803173E+02
41.0	6	+5.9792551E+02	+2.8804269E+01	+6.3590991E+02	+5.7000000E+02	+5.7858496E+02
43.0	2	+6.0702490E+02	+6.4302697E+00	+6.1155981E+02	+6.0248999E+02	+5.7969165E+02
45.0	7	+5.5229687E+02	+1.3038065E+01	+5.6931982E+02	+5.4097998E+02	+5.8079858E+02
46.0	7	+5.6742846E+02	+1.6733157E+01	+5.7643994E+02	+5.3000000E+02	+5.8135180E+02
47.0	2	+6.0458471E+02	+4.2464954E+00	+6.0755981E+02	+6.0160986E+02	+5.8190527E+02
48.0	4	+5.4338232E+02	+4.2273191E+01	+5.8395996E+02	+4.9000000E+02	+5.8245840E+02
49.0	2	+6.2750000E+02	+2.4748737E+01	+6.4500000E+02	+6.1000000E+02	+5.8301196E+02
50.0	4	+5.7875000E+02	+3.2755406E+01	+6.2000000E+02	+5.5000000E+02	+5.8356542E+02
52.0	5	+5.6987573E+02	+3.7071333E+01	+6.1541992E+02	+5.4039990E+02	+5.8467211E+02
53.0	9	+5.7757934E+02	+3.1751080E+01	+6.3804980E+02	+5.5025976E+02	+5.8522534E+02
54.0	16	+5.6214965E+02	+4.1428000E+01	+6.3451977E+02	+5.0500000E+02	+5.8577880E+02
55.0	12	+5.8590072E+02	+3.3847500E+01	+6.2000000E+02	+5.1276977E+02	+5.8633227E+02
56.0	8	+5.6229101E+02	+3.7268351E+01	+6.0815991E+02	+5.0009985E+02	+5.8688549E+02
57.0	6	+5.0331494E+02	+4.7557310E+01	+5.4500000E+02	+5.3694995E+02	+5.8743896E+02
58.0	5	+5.8289575E+02	+3.6655740E+01	+6.2000000E+02	+5.3619995E+02	+5.8799213E+02
60.0	4	+5.7567993E+02	+3.6157913E+01	+6.1500000E+02	+5.2971997E+02	+5.8909912E+02

ANB 3066 PROPELLANT(ANB) TENSILE MAX STRESS, 1750 IN/MIN, 600 PSI, 77 DEG UNLND

****** LINEAR REGRESSION ANALYSIS ******

***** ANALYSIS OF TIME SERIES *****

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
61.0	2	+5.8000000E+02	+1.4142135E+01	+5.9000000E+02	+5.7000000E+02	+5.8965234E+02
62.0	4	+6.2376733E+02	+8.5954070E+00	+6.3662985E+02	+6.1843994E+02	+5.9020581E+02
63.0	6	+6.2679467E+02	+4.1245974E+00	+6.3059981E+02	+6.2000000E+02	+5.9075903E+02
64.0	4	+5.8003222E+02	+7.6235632E+01	+6.7000000E+02	+5.0501977E+02	+5.9131250E+02
65.0	4	+6.3375000E+02	+1.1086778E+01	+6.4500000E+02	+6.2000000E+02	+5.9186596E+02
66.0	2	+6.6000000E+02	+7.0710678E+00	+6.6500000E+02	+6.5500000E+02	+5.9241918E+02
67.0	4	+5.9250000E+02	+1.9842227E+01	+5.8000000E+02	+5.4000000E+02	+5.9297265E+02
68.0	4	+6.4750000E+02	+1.1902380E+01	+6.6500000E+02	+6.4000000E+02	+5.9352587E+02
69.0	10	+6.2435571E+02	+2.1778196E+01	+6.5000000E+02	+5.8655981E+02	+5.9407934E+02
70.0	7	+5.7642846E+02	+3.5203490E+01	+6.2500000E+02	+5.4000000E+02	+5.9463281E+02
71.0	3	+5.6663305E+02	+2.6665253E+01	+5.9736987E+02	+5.4973999E+02	+5.9518603E+02
72.0	19	+5.9281860E+02	+3.7021402E+01	+6.6000000E+02	+5.3000000E+02	+5.9573950E+02

ANE 3066 PROPELLANT(ANB) TENSILE MAX STRESS, 1750 IN/MIN, 000 PSI, 77 DEG UNLND

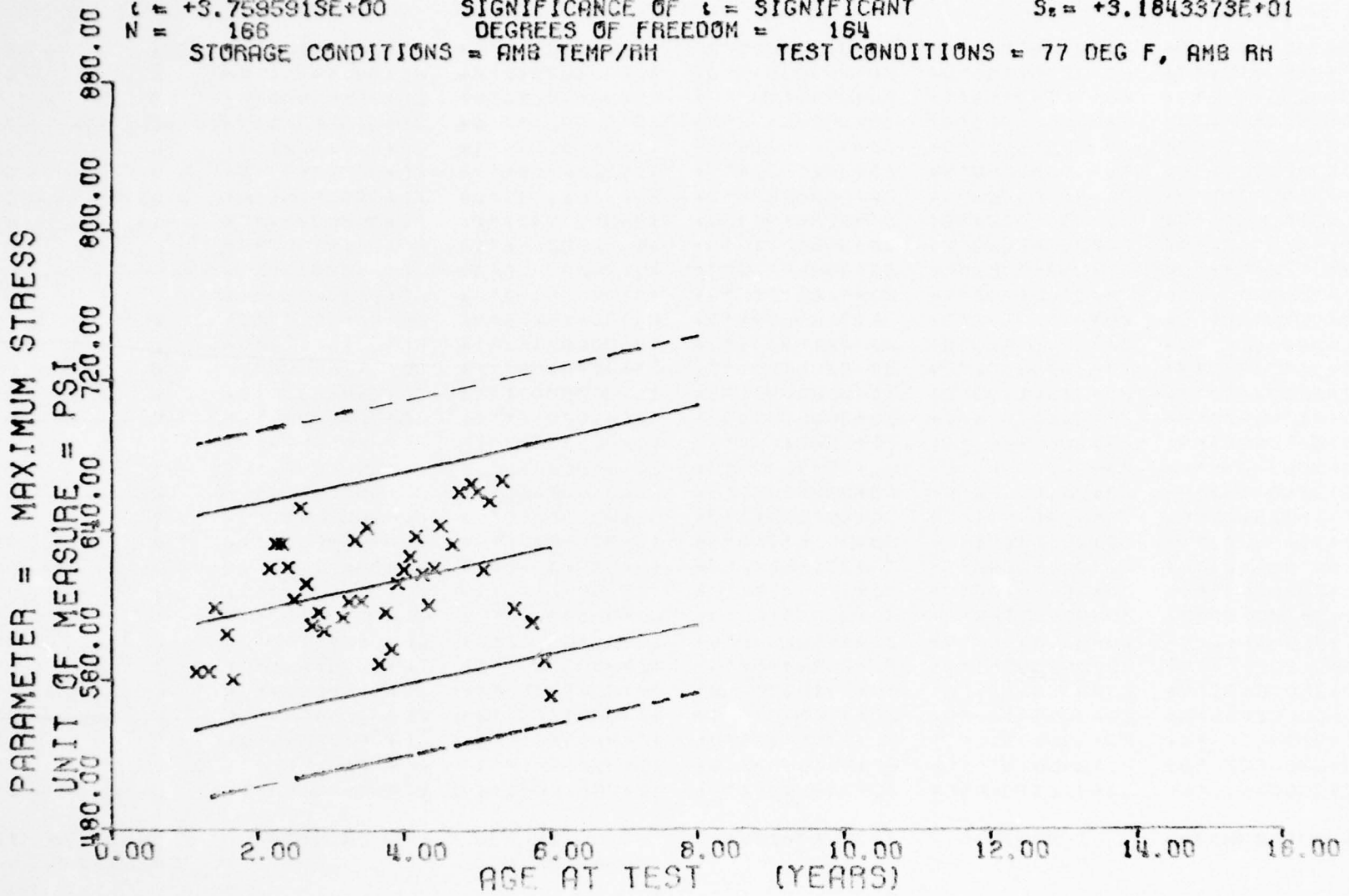

Y = ((+5.8116822E+02) + (+6.9764555E-01) * X)
F = +1.4134526E+01 SIGNIFICANCE OF F = SIGNIFICANT σ = +3.3086524E+01
R = +2.8168685E-01 SIGNIFICANCE OF R = SIGNIFICANT S_e = +1.8556419E-01
t = +3.759591SE+00 SIGNIFICANCE OF t = SIGNIFICANT S_t = +3.1843373E+01
N = 166 DEGREES OF FREEDOM = 164
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = 77 DEG F, AMB RH
PARAMETER = MAXIMUM STRESS
UNIT OF MEASURE = PSI
480.00
560.00
640.00
720.00
800.00
880.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
ANB 3066 PROPELLANT(ANT) TENSILE MAX STRESS, 1750 IN/MIN, 600 PSI, 77 DEG UNLND

Figure 5-5

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
14.0	2	+5.6455468E+02	+1.4203308E+01	+5.7458984E+02	+5.5451977E+02	+5.9093505E+02
16.0	3	+5.6434943E+02	+1.2145975E+01	+5.7602978E+02	+5.5193994E+02	+5.9233032E+02
17.0	5	+5.9893779E+02	+1.7164894E+01	+6.1810992E+02	+5.7316992E+02	+5.9302897E+02
19.0	2	+5.8450976E+02	+2.1727169E+01	+5.9986987E+02	+5.6914990E+02	+5.9442333E+02
20.0	2	+5.6053491E+02	+4.0124323E+00	+5.6335986E+02	+5.5770996E+02	+5.9512109E+02
26.0	1	+6.1984985E+02	+0.0000000E+75	+6.1984985E+02	+6.1984985E+02	+5.9930688E+02
27.0	2	+6.3314477E+02	+5.0326571E+00	+6.3668994E+02	+6.2959995E+02	+6.0003463E+02
28.0	1	+6.3310986E+02	+0.0000000E+83	+6.3310986E+02	+6.3310986E+02	+6.0070214E+02
29.0	2	+6.2063989E+02	+1.7597668E+01	+6.3307983E+02	+6.0819995E+02	+6.0139990E+02
30.0	3	+6.0311645E+02	+4.2450181E+01	+6.3619995E+02	+5.5525000E+02	+6.0209741E+02
31.0	2	+6.5223486E+02	+5.5078841E+01	+6.9117993E+02	+6.1328979E+02	+6.0279516E+02
32.0	1	+6.1185986E+02	+0.0000000E+99	+6.1185986E+02	+6.1185986E+02	+6.0349267E+02
33.0	2	+5.8946484E+02	+4.9202099E+00	+5.9291992E+02	+5.8609976E+02	+6.0419042E+02
34.0	1	+5.9669995E+02	+0.0000000E+07	+5.9669995E+02	+5.9669995E+02	+6.0488793E+02
35.0	3	+5.8566967E+02	+1.2110063E+01	+5.9937988E+02	+5.7528979E+02	+6.0558569E+02
38.0	5	+5.9382983E+02	+7.4940201E+00	+6.0347998E+02	+5.8751977E+02	+6.0767871E+02
39.0	5	+6.0228784E+02	+1.7345633E+01	+6.1854980E+02	+5.8061987E+02	+6.0837622E+02
40.0	2	+6.3520971E+02	+7.2531863E+00	+6.4031982E+02	+6.3009985E+02	+6.0907397E+02
41.0	7	+5.9250537E+02	+1.1917630E+01	+6.1876977E+02	+5.8755981E+02	+6.0977148E+02
42.0	3	+6.4206640E+02	+4.9276199E+00	+6.4632983E+02	+6.3665991E+02	+6.1046923E+02
44.0	5	+5.6909814E+02	+2.5414694E+01	+5.9151977E+02	+5.3657983E+02	+6.1186450E+02
45.0	6	+5.9678808E+02	+1.3376974E+01	+6.1312988E+02	+5.7908984E+02	+6.1256225E+02
46.0	4	+5.7691479E+02	+1.7432863E+01	+6.0170996E+02	+5.6092993E+02	+6.1325976E+02
47.0	11	+6.1200803E+02	+3.1016174E+01	+6.4367993E+02	+5.7220996E+02	+6.1395751E+02
48.0	10	+6.1945068E+02	+2.2561757E+01	+6.5388989E+02	+5.8829980E+02	+6.1465502E+02
49.0	6	+6.2640820E+02	+1.4834233E+01	+6.4302978E+02	+6.0970996E+02	+6.1535278E+02
50.0	9	+6.3721777E+02	+1.9657499E+01	+6.8129980E+02	+6.1645996E+02	+6.1605029E+02
51.0	3	+6.1704321E+02	+1.2247862E+01	+6.2445996E+02	+6.0289990E+02	+6.1674804E+02
52.0	2	+6.0043483E+02	+8.5222648E+00	+6.0647998E+02	+5.9442993E+02	+6.1744555E+02
53.0	12	+6.1996118E+02	+2.0686816E+01	+6.5133984E+02	+5.9517993E+02	+6.1814331E+02
54.0	7	+6.4282392E+02	+1.1055964E+01	+6.5484985E+02	+6.2233984E+02	+6.1884106E+02

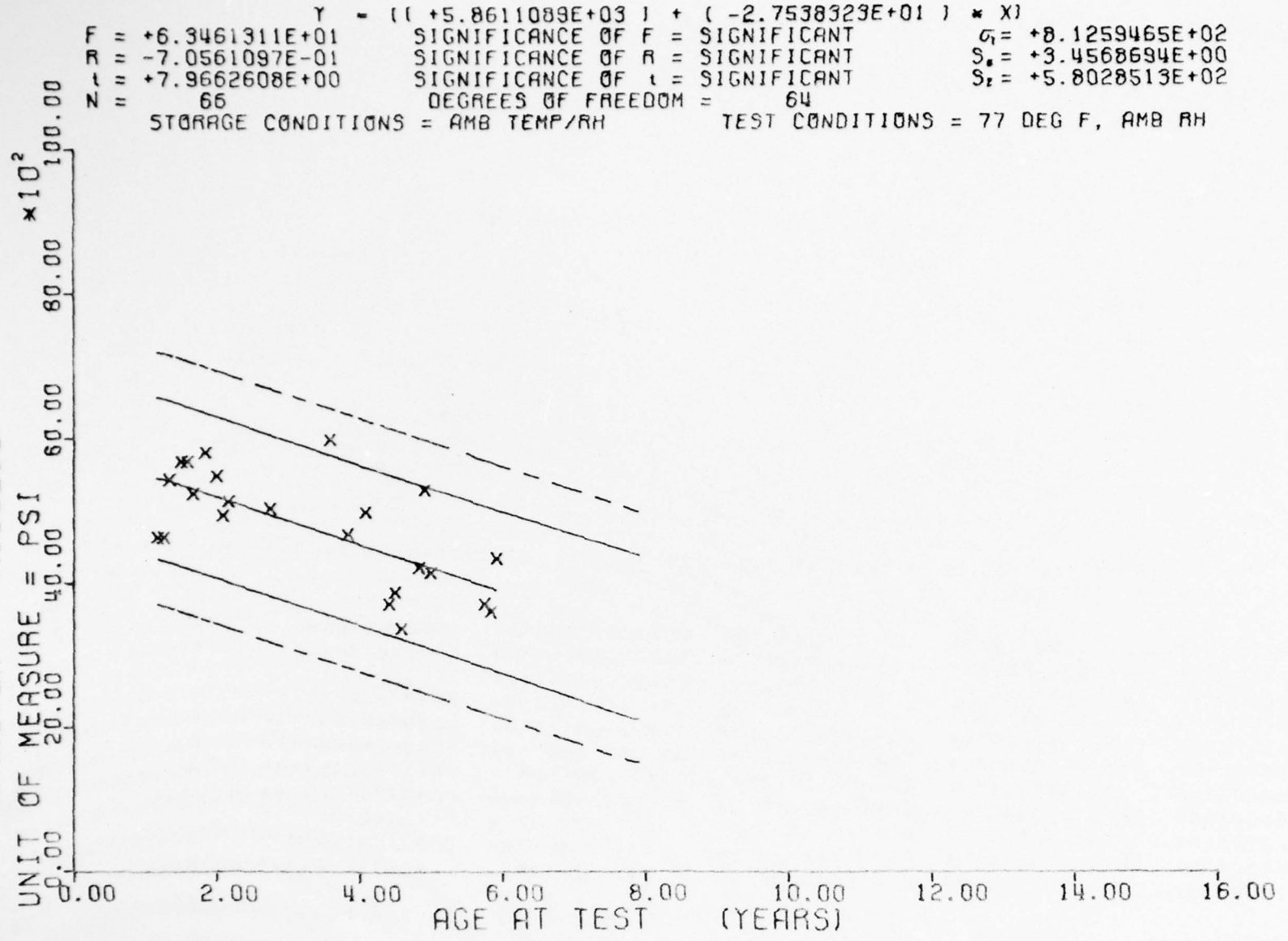
ANB-3066 PROPELLANT(ANT) TENSILE MAX STRESS, 1750 IN/MIN, 600 PSI, 77 DEG UNLND

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
55.0	6	+6.3268813E+02	+3.6192994E+01	+6.8621997E+02	+6.0117993E+02	+6.2023632E+02
57.0	6	+6.3054457E+02	+3.4945907E+01	+6.8677976E+02	+6.0585956E+02	+6.2093383E+02
59.0	2	+6.3507983E+02	+1.6367982E+00	+6.3621997E+02	+6.3393954E+02	+6.2332910E+02
60.0	2	+6.3055981E+02	+5.8803078E+00	+6.3470995E+02	+6.3640971E+02	+6.2302685E+02
61.0	2	+6.1912988E+02	+5.6735277E+00	+6.2312988E+02	+6.1512988E+02	+6.2372436E+02
62.0	2	+6.5580493E+02	+4.0661125E+00	+6.5866992E+02	+6.5293994E+02	+6.2442211E+02
64.0	4	+6.1671972E+02	+2.2815007E+01	+6.1959985E+02	+6.1311982E+02	+6.2581738E+02
66.0	2	+5.9879989E+02	+5.5267919E+00	+6.0229995E+02	+5.9489993E+02	+6.2721264E+02
67.0	4	+5.9120483E+02	+7.5957975E+00	+5.9818994E+02	+5.7997998E+02	+6.2930566E+02
71.0	4	+5.7076439E+02	+2.4979734E+00	+5.7278979E+02	+5.6730981E+02	+6.3070092E+02
72.0	2	+5.5171997E+02	+9.9290157E+00	+5.5873999E+02	+5.4469995E+02	+6.3139868E+02

ANB 3,66 PROPELLANT(ANT) TENSILE MAX STRESS, 175C IN/MIN, 600 PSI, 77 DEG UNLND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R = -7.0561097E-01 SIGNIFICANCE OF R = SIGNIFICANT
t = +7.9662608E+00 SIGNIFICANCE OF t = SIGNIFICANT
N = 66 DEGREES OF FREEDOM = 64
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = 77 DEG F, AMB RH
PARAMETER = MODULUS
UNIT OF MEASURE = PSI *10²
0.00
20.00
40.00
60.00
80.00
100.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
ANB 3066 PROPELLANT (ANA) TENSILE MODULUS, 1750 IN/MIN, 600 PSI, 77 DEG UNLND

Figure 5-6

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

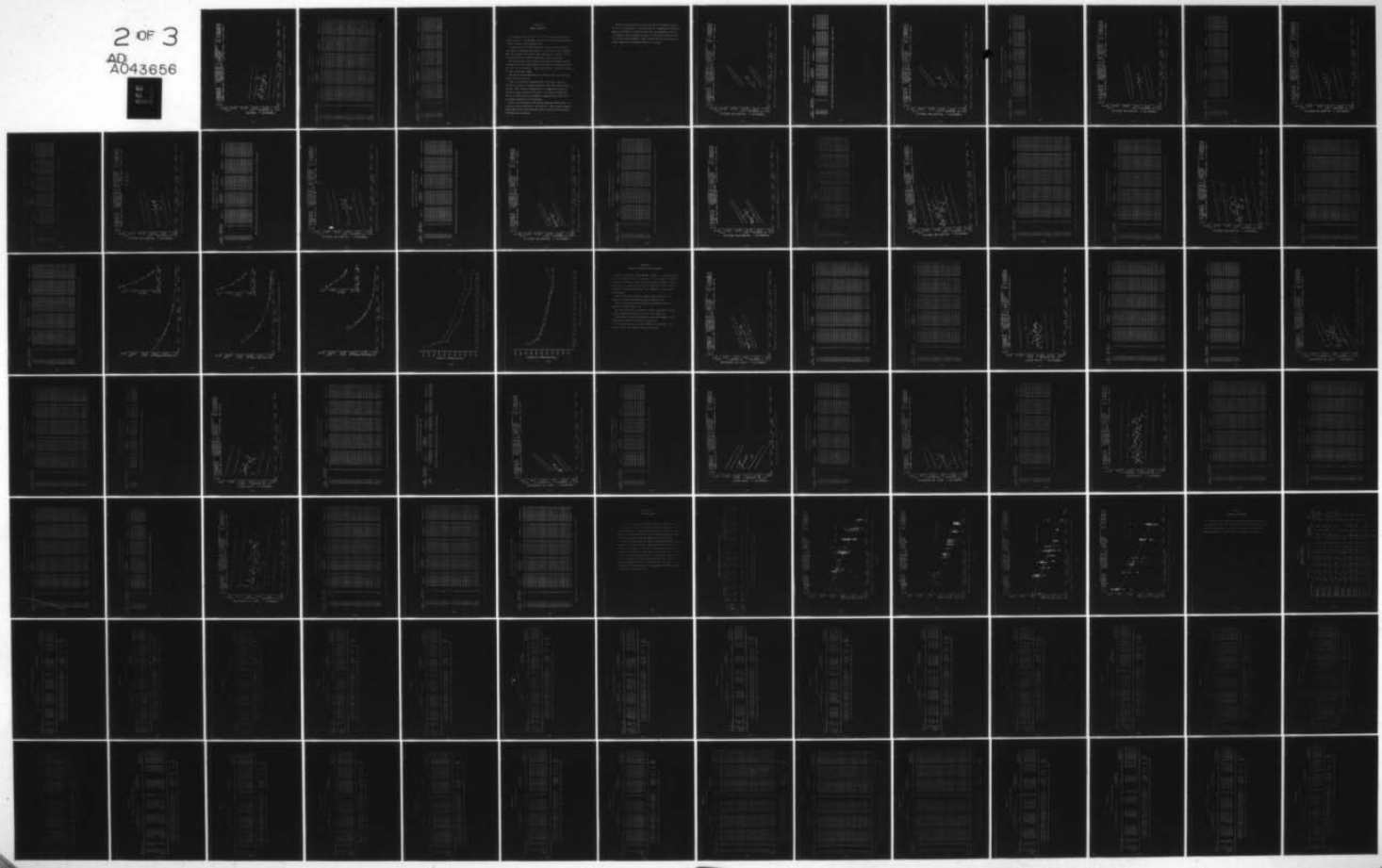
AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
14.0	2	+4.450000E+03	+7.071068E+01	+4.700000E+03	+4.600000E+03	+5.475570E+03
15.0	2	+4.550000E+03	+3.535534E+02	+4.900000E+03	+4.400000E+03	+5.448031E+03
16.0	2	+5.450000E+03	+7.778175E+02	+6.000000E+03	+4.900000E+03	+5.420492E+03
18.0	2	+5.700000E+03	+1.414214E+02	+5.800000E+03	+5.600000E+03	+5.365417E+03
19.0	2	+5.700000E+03	+1.414214E+02	+5.800000E+03	+5.600000E+03	+5.337878E+03
20.0	2	+4.250000E+03	+4.949747E+02	+4.600000E+03	+4.900000E+03	+5.310339E+03
22.0	4	+5.225000E+03	+6.344208E+02	+6.000000E+03	+5.100000E+03	+5.255262E+03
24.0	2	+5.500000E+03	+1.414214E+02	+5.600000E+03	+5.400000E+03	+5.200185E+03
25.0	2	+4.950000E+03	+3.535534E+02	+5.200000E+03	+4.700000E+03	+5.172648E+03
26.0	2	+5.150000E+03	+3.535534E+02	+5.400000E+03	+4.900000E+03	+5.145109E+03
32.0	2	+5.050000E+03	+2.121320E+02	+5.200000E+03	+4.900000E+03	+4.952343E+03
43.0	2	+6.000000E+03	+0.000000E+03	+6.000000E+03	+6.000000E+03	+4.676960E+03
46.0	2	+4.875000E+03	+1.449396E+02	+4.790000E+03	+4.585000E+03	+4.594343E+03
48.0	1	+5.000000E+03	+0.000000E+11	+5.000000E+03	+5.000000E+03	+4.511730E+03
53.0	3	+3.727333E+03	+3.260879E+01	+3.762000E+03	+3.697000E+03	+4.401574E+03
54.0	3	+4.183333E+03	+1.457905E+02	+4.012000E+03	+3.733000E+03	+4.374039E+03
55.0	3	+3.383000E+03	+1.198081E+02	+3.512000E+03	+3.276000E+03	+4.346500E+03
56.0	5	+4.224500E+03	+4.082145E+02	+4.736000E+03	+3.729000E+03	+4.263828E+03
59.0	1	+5.300000E+03	+0.000000E+31	+5.300000E+03	+5.300000E+03	+4.236347E+03
60.0	3	+4.157333E+03	+3.019353E+02	+4.417000E+03	+3.826000E+03	+4.208809E+03
65.0	6	+3.723666E+03	+1.625197E+02	+3.913000E+03	+3.445000E+03	+3.960964E+03
71.0	3	+3.615000E+03	+2.589401E+01	+3.630000E+03	+3.585000E+03	+3.923426E+03
72.0	3	+4.355333E+03	+3.168872E+02	+4.879000E+03	+3.919000E+03	+3.905887E+03

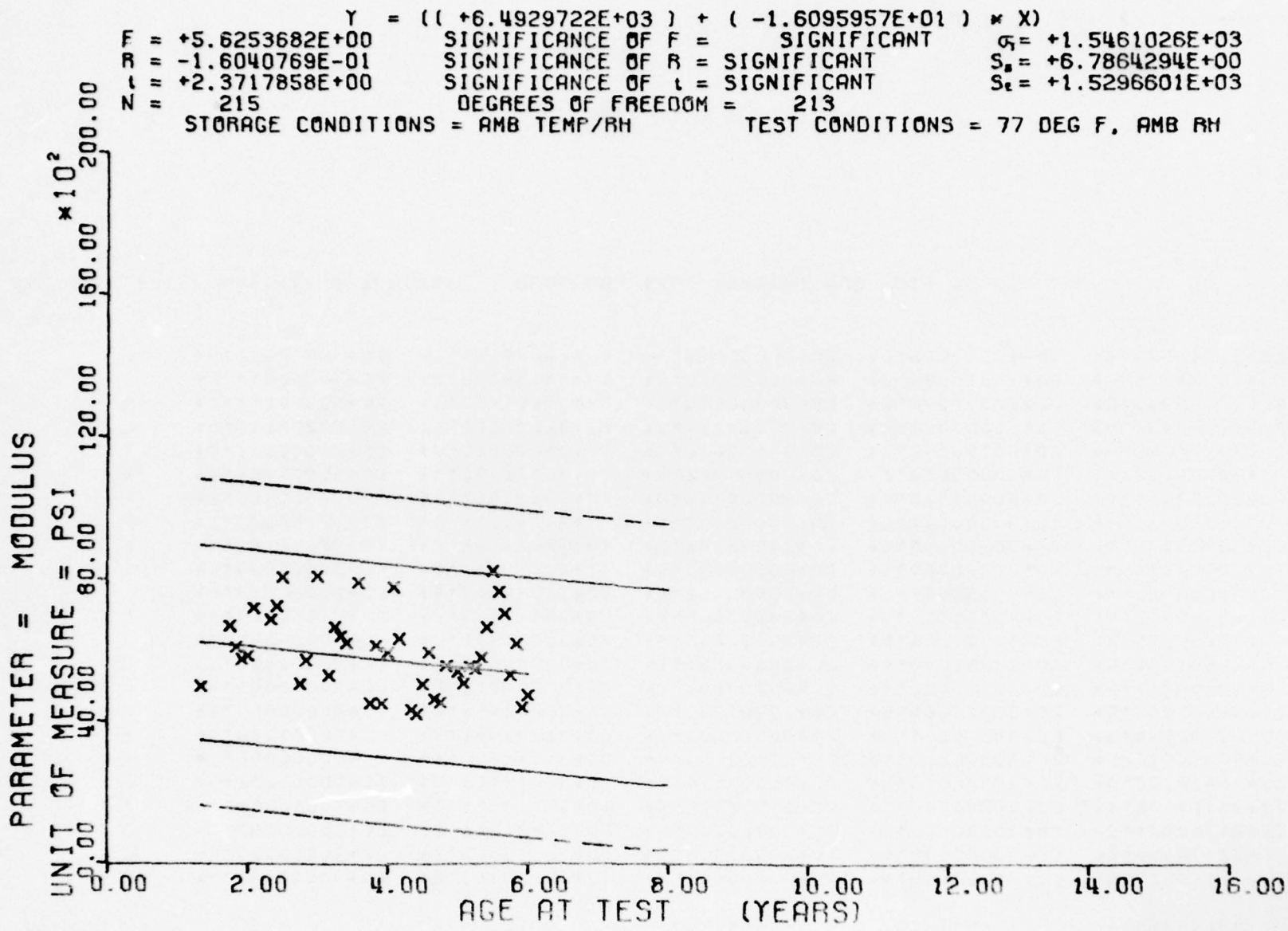
SOLID ROCKET PROPELLANT(ANA) TENSILE MODULUS, 1750 IN/MIN, 600 PSI, 77 DEG UNLND

AD-A043 656 OGDEN AIR LOGISTICS CENTER HILL AFB UTAH PROPELLANT L--ETC F/G 21/9.2
PROPELLANT SURVEILLANCE REPORT MINUTEMAN III STAGE III,(U)
JUL 77 E M DALABA

UNCLASSIFIED MANCP-374(77) NL

2 OF 3
AD A043656

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F = +5.6253682E+00 SIGNIFICANCE OF F = SIGNIFICANT σ = +1.5461026E+03
R = -1.6040769E-01 SIGNIFICANCE OF R = SIGNIFICANT S_a = +6.7864294E+00
t = +2.3717858E+00 SIGNIFICANCE OF t = SIGNIFICANT S_t = +1.5296601E+03
N = 215 DEGREES OF FREEDOM = 213
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = 77 DEG F, AMB RH
PARAMETER = MODULUS
UNIT OF MEASURE = PSI *10^2
0.00
40.00
80.00
120.00
160.00
200.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
ANB 3066 PROPELLANT(ANB) TENSILE MODULUS, 1750 IN/MIN, 600 PSI, 77 DEG F, UNLND

Figure 5-7

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
16.0	8	+4.5901250E+03	+1.8282959E+03	+7.5000000E+03	+3.1470000E+03	+6.2354335E+03
21.0	2	+6.7000000E+03	+2.8284271E+02	+6.9000000E+03	+6.5000000E+03	+6.1549570E+03
22.0	2	+6.1000000E+03	+2.8284271E+02	+6.3000000E+03	+5.9000000E+03	+6.1388593E+03
23.0	2	+5.7500000E+03	+2.1213203E+02	+5.9000000E+03	+5.6000000E+03	+6.1227617E+03
24.0	2	+5.8500000E+03	+4.9497474E+02	+6.2000000E+03	+5.5000000E+03	+6.1066679E+03
25.0	2	+7.2000000E+03	+8.4852813E+02	+7.8000000E+03	+6.6000000E+03	+6.0905703E+03
28.0	6	+6.8833320E+03	+7.5078490E+02	+7.6000000E+03	+5.7000000E+03	+6.0422851E+03
29.0	2	+7.2500000E+03	+7.7781745E+02	+7.8000000E+03	+6.7000000E+03	+6.0261875E+03
30.0	4	+6.0750000E+03	+1.1176612E+03	+8.2000000E+03	+6.8000000E+03	+6.0100898E+03
33.0	2	+5.0500000E+03	+3.5355339E+02	+5.3000000E+03	+4.8000000E+03	+5.9618046E+03
34.0	6	+5.7166640E+03	+6.8239773E+02	+6.6000000E+03	+5.0000000E+03	+5.9457070E+03
36.0	2	+8.1000000E+03	+2.8284271E+02	+8.3000000E+03	+7.9000000E+03	+5.9135156E+03
38.0	1	+5.3000000E+03	+0.0000000E+19	+5.3000000E+03	+5.3000000E+03	+5.8813242E+03
39.0	4	+6.6750000E+03	+1.5261607E+03	+8.4000000E+03	+5.2000000E+03	+5.8652265E+03
40.0	2	+6.4100000E+03	+8.6267027E+02	+7.0200000E+03	+5.8000000E+03	+5.8491328E+03
41.0	6	+6.2076640E+03	+8.2744901E+02	+7.1000000E+03	+4.9000000E+03	+5.8330351E+03
43.0	2	+7.9195000E+03	+4.3075515E+01	+7.9500000E+03	+7.8890000E+03	+5.8008437E+03
45.0	7	+4.5314257E+03	+1.6618149E+03	+7.1000000E+03	+3.4360000E+03	+5.7686523E+03
46.0	7	+6.1602851E+03	+1.7611238E+03	+8.9000000E+03	+3.9780000E+03	+5.7525546E+03
47.0	2	+4.5210000E+03	+2.4039550E+02	+4.6910000E+03	+4.3510000E+03	+5.7364609E+03
48.0	4	+5.9500000E+03	+5.4467115E+02	+6.7000000E+03	+5.5000000E+03	+5.7203632E+03
49.0	2	+7.8000000E+03	+1.4142135E+02	+7.9000000E+03	+7.7000000E+03	+5.7042695E+03
50.0	4	+6.3500000E+03	+1.5545631E+03	+8.0000000E+03	+4.7000000E+03	+5.6881718E+03
52.0	5	+4.3470000E+03	+1.7056596E+02	+4.5790000E+03	+4.1120000E+03	+5.6559804E+03
53.0	9	+4.2291093E+03	+2.3852658E+02	+4.5240000E+03	+3.7970000E+03	+5.6398828E+03
54.0	16	+5.0713125E+03	+1.9062836E+03	+8.3000000E+03	+2.6400000E+03	+5.6237890E+03
55.0	12	+5.9765000E+03	+1.8556542E+03	+8.6000000E+03	+3.1590000E+03	+5.6076914E+03
56.0	8	+4.6466250E+03	+1.1056623E+03	+6.6000000E+03	+3.6080000E+03	+5.5915976E+03
57.0	6	+4.5623320E+03	+1.3823006E+03	+6.3000000E+03	+3.3380000E+03	+5.5755000E+03
58.0	5	+5.5923984E+03	+1.9249542E+03	+7.9000000E+03	+3.9640000E+03	+5.5594062E+03
60.0	4	+5.4225000E+03	+9.2869008E+02	+6.8000000E+03	+4.9000000E+03	+5.5272109E+03

ANB 3066 PROPELLANT(ANB) TENSILE MODULUS, 1750 IN/MIN, 600 PSI, 77 DEG F, UNLND

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
61.0	2	+5.1000000E+03	+1.4142135E+02	+5.2000000E+03	+5.0000000E+03	+5.5111171E+03
62.0	4	+5.5790000E+03	+1.0672700E+03	+6.6000000E+03	+4.6120000E+03	+5.4950195E+03
63.0	6	+5.4961640E+03	+1.6485099E+03	+7.9000000E+03	+4.2710000E+03	+5.4789257E+03
64.0	4	+5.8253000E+03	+4.9244289E+02	+6.4000000E+03	+5.2000000E+03	+5.4628281E+03
65.0	4	+6.6750000E+03	+1.3022416E+03	+7.9000000E+03	+5.5000000E+03	+5.4467343E+03
66.0	2	+8.2500000E+03	+7.7781745E+02	+8.8000000E+03	+7.7000000E+03	+5.4306367E+03
67.0	4	+7.6750000E+03	+3.5939764E+02	+8.2000000E+03	+7.4000000E+03	+5.4145429E+03
68.0	4	+7.0500000E+03	+1.6296331E+03	+8.8000000E+03	+5.3000000E+03	+5.3984453E+03
69.0	10	+5.3167968E+03	+1.0727970E+03	+6.4000000E+03	+3.0550000E+03	+5.3823476E+03
70.0	7	+6.2142851E+03	+9.2452036E+02	+7.5000000E+03	+5.2000000E+03	+5.3662539E+03
71.0	3	+4.4210000E+03	+4.5076521E+02	+4.9690000E+03	+4.0220000E+03	+5.3501562E+03
72.0	19	+4.7586289E+03	+1.2444507E+03	+7.7000000E+03	+3.3100000E+03	+5.3340625E+03

AND 3066 PROPELLANT(ANB) TENSILE MODULUS, 1750 IN/MIN, 600 PSI, 77 DEG F, UNLND

SECTION VI

STRESS RELAXATION

An end-bonded 1/2" x 1/2" x 4" (1.27 x 1.27 x 10.16cm) is used on the Stress Relaxometer. The specimens are tested at seven different temperatures to derive a master stress relaxation curve.

A strain of 1% at 77°F (25.0°C) was not introduced into the program until Phase 3 of Minuteman III testing and Phase B Series 2 for Minuteman II which has resulted in a relatively short time frame for analysis. Prior to that time strains of 3% and/or 5% were used to form the data base.

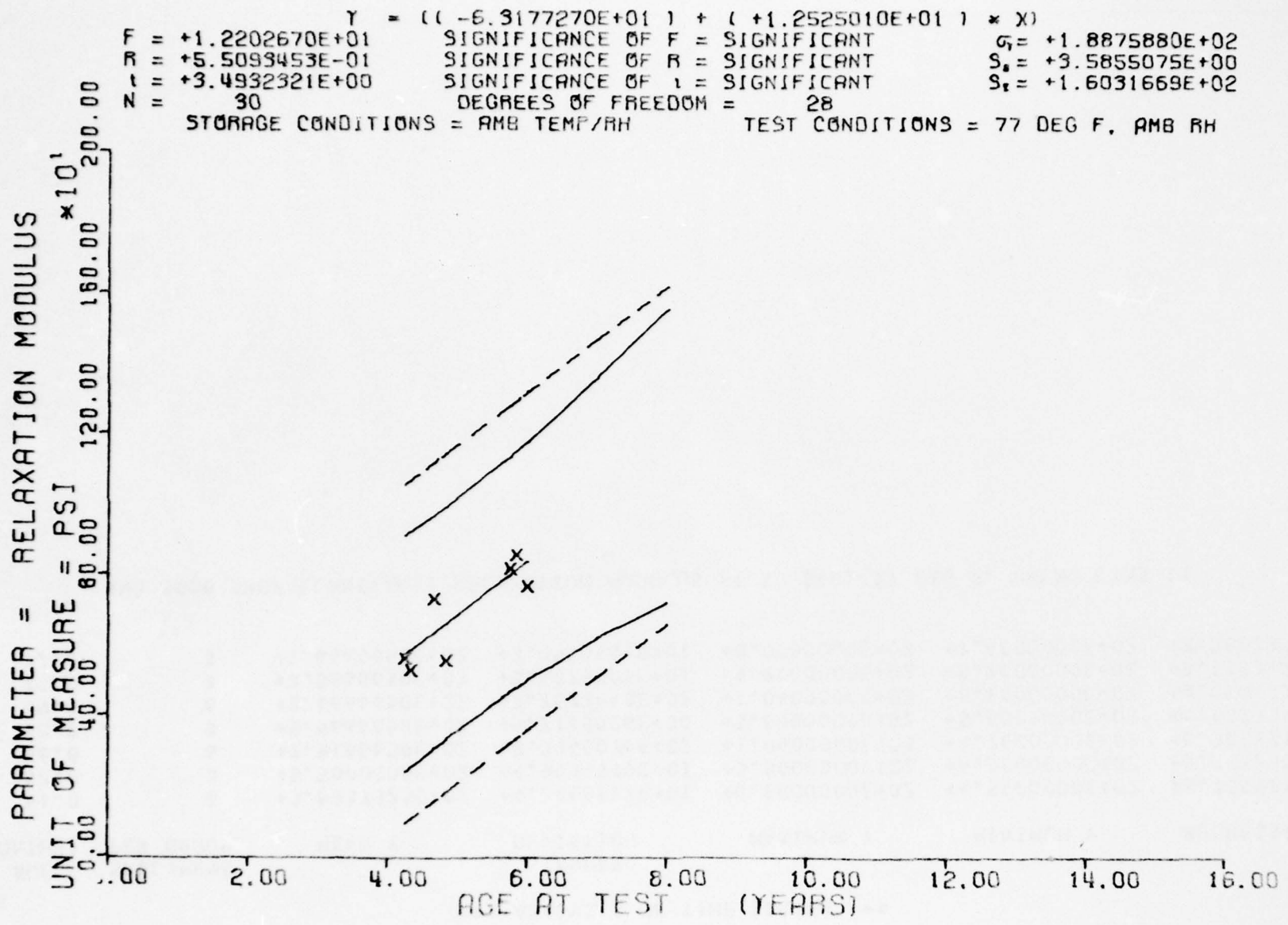
ANA unlined cartons show a significant increase in relaxation modulus (Figures 6-1 and 6-2). ANB unlined cartons do not show a significant change at 10 sec. but do at 1000 sec. (Figures 6-3 and 6-4). ANT unlined cartons do not show a significant change.

When ANA and ANB unlined cartons are combined, there is no significant change (Figures 6-5 and 6-6).

There is no significant change for ANB lined cartons. There is a significant increase in relaxation modulus for ANT lined cartons (Figures 6-7 and 6-8). When all ANB is combined there is a significant increase in relaxation modulus (Figures 6-9 and 6-10). The increase in relaxation modulus is consistent with the increase in uniaxial tesile modulus and 10 sec hardness exhibited by this propellant.

Master stress relaxation curves include lined and unlined cartons. The curves are shown in Figures 6-11, 6-12 and 6-13. There is better agreement between ANB and ANT than between ANB and ANA. At lower test temperatures differences are accentuated.

Gradient stress relaxation was run on mini-stress relaxation specimens (0.1 x 0.5 x 2" specimens) at 1% strain and 77°F. Minimum stress relaxation modulus is reached at 2.2 inches from the bond line (Figures 6-14 and 6-15). It is apparent from the graphs that there is a sharp drop in modulus between the first and second specimens. Several cartons had liner which penetrated several samples which caused much disparity in the data.



ANS 3066 PROPELLANT (ANA) RELAXATION MODULUS AT 10 SEC, 77 DEG F, UNLND CTNS 1X

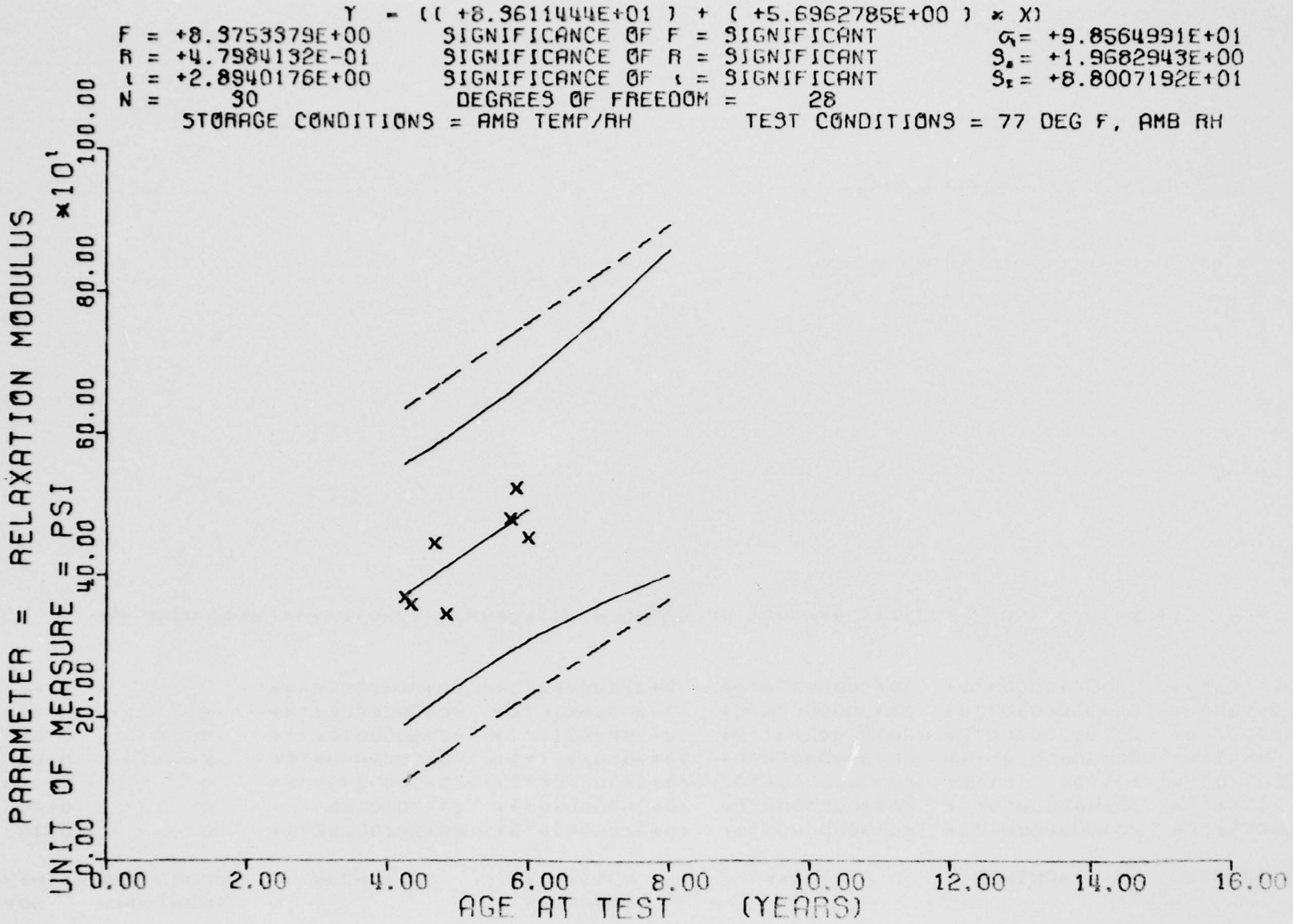
Figure 6-1

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
51.0	6	+5.6333325E+02	+9.2448183E+01	+6.8000000E+02	+4.5C00000E+02	+5.7559814E+02
52.0	3	+5.3000000E+02	+4.9999999E+01	+5.8000000E+02	+4.8C00000E+02	+5.8812304E+02
56.0	6	+7.3166650E+02	+2.3945076E+02	+1.0400000E+03	+4.7C00000E+02	+6.3822314E+02
58.0	3	+5.5666650E+02	+5.7735026E+00	+5.6000000E+02	+5.5000000E+02	+6.6327319E+02
69.0	6	+8.1666650E+02	+2.2677448E+02	+1.0400000E+03	+6.1C00000E+02	+8.0104833E+02
70.0	3	+8.5666650E+02	+5.5075705E+01	+9.2000000E+02	+8.2C00000E+02	+8.1357324E+02
72.0	3	+7.6666650E+02	+3.0550504E+01	+8.0000000E+02	+7.4C00000E+02	+8.3862329E+02

ANB 3066 PROPELLANT(ANA) RELAXATION MODULUS AT 10 SEC, 77 DEG F, UNLND CTNS 1%



ANB 3066 PROPELLANT(ANA) RELAXATION MODULUS AT 1000 SEC 77 DEG F UNLND CTNS 1%

Figure 6-2

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
51.0	5	+3.7000000E+02	+5.6568542E+01	+4.4000000E+02	+3.1000000E+02	+3.7412158E+02
52.0	3	+3.6000000E+02	+1.9999999E+01	+3.8000000E+02	+3.4000000E+02	+3.7981787E+02
56.0	6	+4.4666650E+02	+1.2242004E+02	+6.1000000E+02	+3.1000000E+02	+4.0260302E+02
58.0	3	+3.4666650E+02	+1.1547005E+01	+3.6000000E+02	+3.4000000E+02	+4.1399536E+02
69.0	6	+4.8000000E+02	+1.3175735E+02	+6.1000000E+02	+3.5000000E+02	+4.7665454E+02
70.0	3	+5.2333325E+02	+2.3094010E+01	+5.5000000E+02	+5.1000000E+02	+4.8235083E+02
72.0	3	+4.5333325E+02	+1.5275252E+01	+4.7000000E+02	+4.4000000E+02	+4.9374340E+02

AND 3066 PROPELLANT(ANA) RELAXATION MODULUS AT 1000 SEC 77 DEG F UNLND CTNS 1%

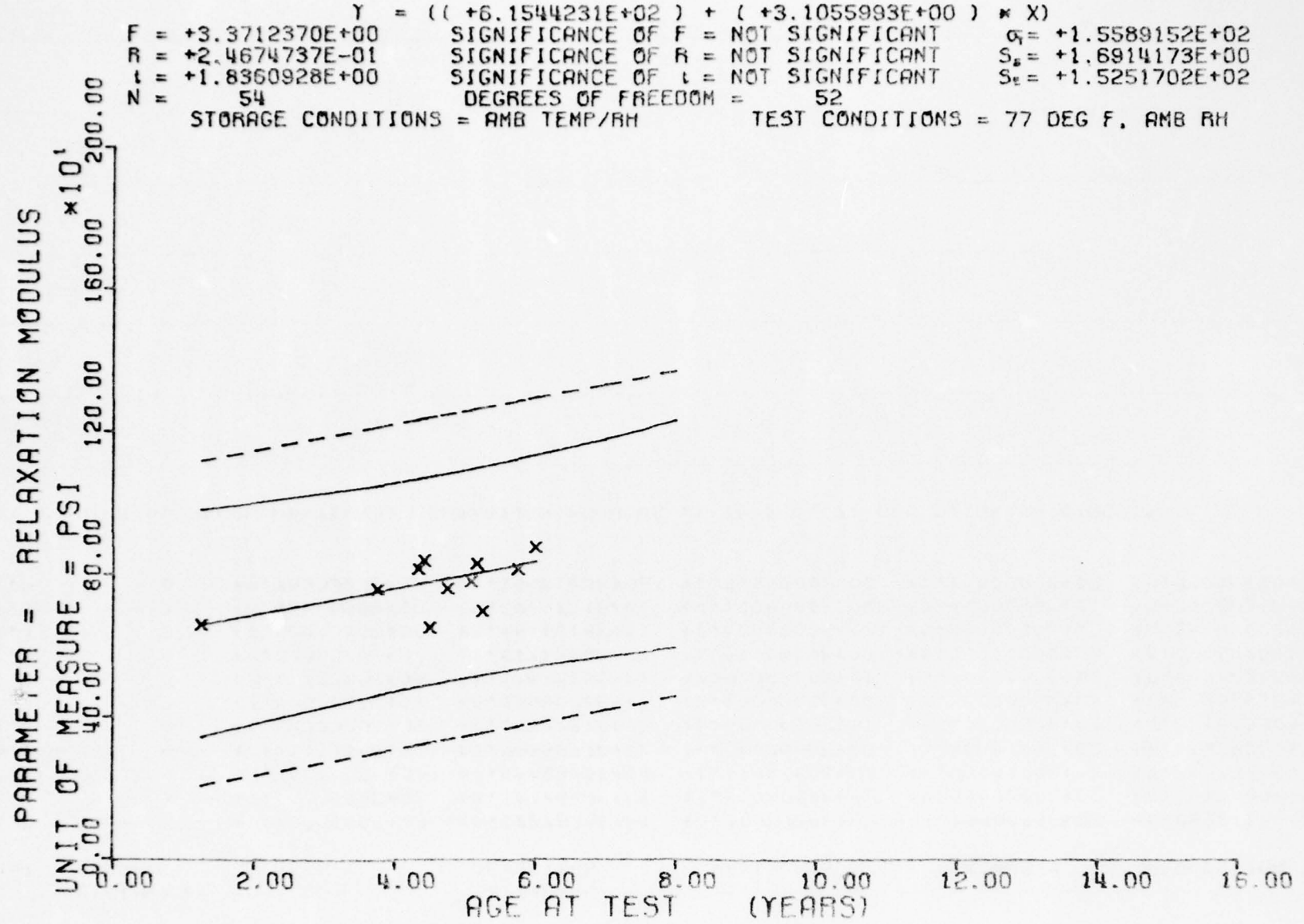

Y = ((+6.1544231E+02) + (+3.1055993E+00) * X)
F = +3.3712370E+00 SIGNIFICANCE OF F = NOT SIGNIFICANT σ = +1.5589152E+02
R = +2.4674737E-01 SIGNIFICANCE OF R = NOT SIGNIFICANT S_b = +1.6914173E+00
t = +1.8360928E+00 SIGNIFICANCE OF t = NOT SIGNIFICANT S_e = +1.5251702E+02
N = 54 DEGREES OF FREEDOM = 52
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = 77 DEG F, AMB RH
PARAMETER = RELAXATION MODULUS
UNIT OF MEASURE = PSI *10¹
200.00
160.00
120.00
80.00
40.00
0.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
ANB 3066 PROPELLANT(ANB) RELAXATION MODULUS AT 10 SEC, 77 DEG F, UNLND CTNS 1X

Figure 6-3

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
15.0	3	+6.600000E+02	+6.082763E+01	+7.300000E+02	+6.200000E+02	+6.620261E+02
45.0	3	+7.600000E+02	+5.567764E+01	+8.100000E+02	+7.000000E+02	+7.551940E+02
50.0	9	+8.166665E+02	+1.957038E+02	+1.170000E+03	+4.900000E+02	+7.769333E+02
53.0	9	+8.411110E+02	+1.585587E+02	+1.040000E+03	+6.400000E+02	+7.800390E+02
54.0	6	+6.533332E+02	+1.155277E+02	+8.000000E+02	+5.400000E+02	+7.831445E+02
57.0	3	+7.633332E+02	+6.806859E+01	+8.400000E+02	+7.100000E+02	+7.924614E+02
61.0	3	+7.933332E+02	+1.154701E+01	+7.900000E+02	+7.700000E+02	+8.048837E+02
62.0	6	+8.333332E+02	+2.527185E+02	+1.090000E+03	+6.000000E+02	+8.079892E+02
63.0	3	+7.000000E+02	+3.464101E+01	+7.400000E+02	+6.800000E+02	+8.110949E+02
69.0	3	+8.166665E+02	+8.621678E+01	+9.100000E+02	+7.400000E+02	+8.297285E+02
72.0	6	+8.783332E+02	+1.194012E+02	+1.010000E+03	+7.100000E+02	+8.390454E+02

AND 3066 PROPELLANT(AN3) RELAXATION MODULUS AT 10 SEC, 77 DEG F, UNLND CTNS 1%

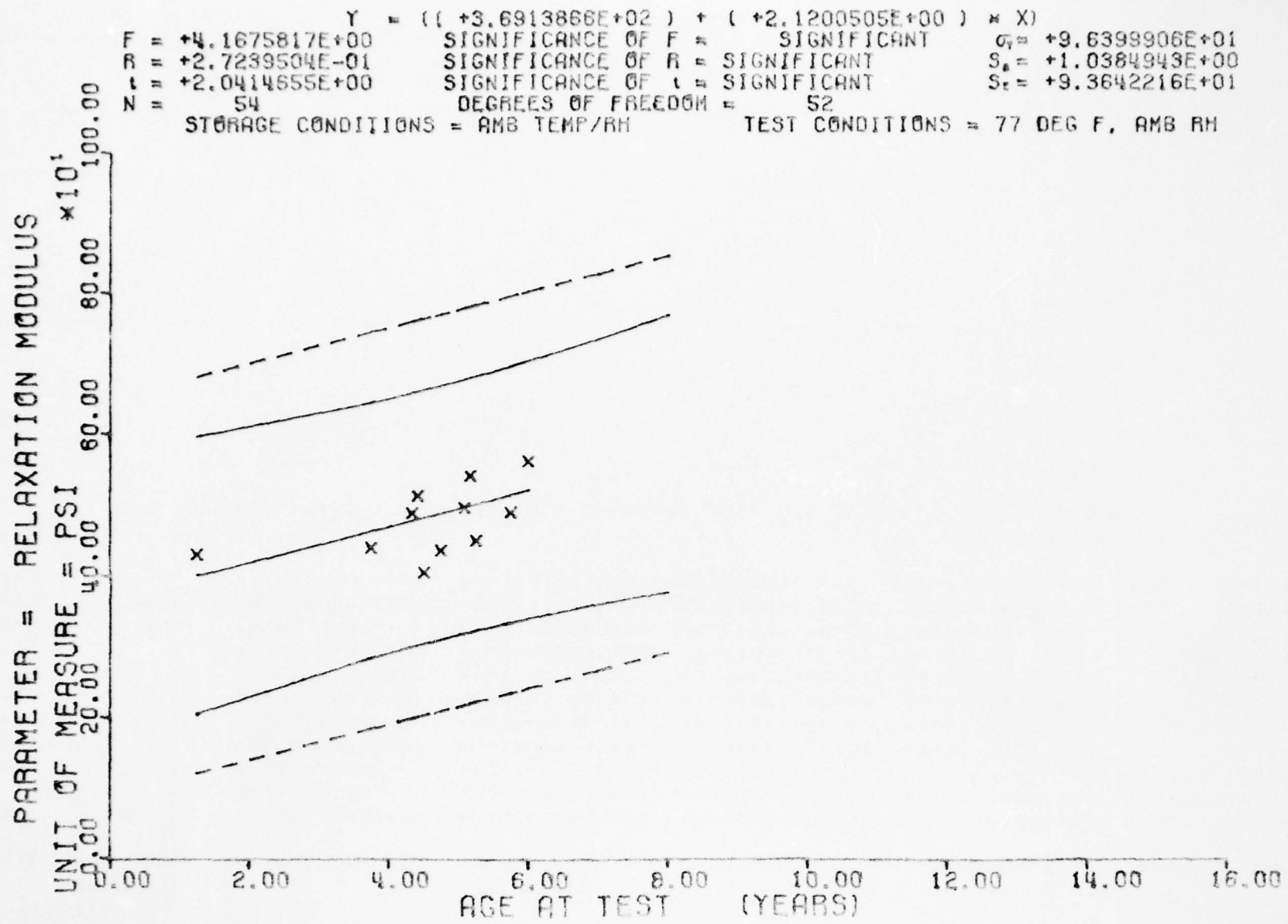

Y = ((+3.6913866E+02) + (+2.1200505E+00) * X)
F = +4.1675817E+00 SIGNIFICANCE OF F = SIGNIFICANT σ = +9.6399906E+01
R = +2.7239504E-01 SIGNIFICANCE OF R = SIGNIFICANT S = +1.0384943E+00
t = +2.0414655E+00 SIGNIFICANCE OF t = SIGNIFICANT S = +9.3642216E+01
N = 54 DEGREES OF FREEDOM = 52
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = 77 DEG F, AMB RH
PARAMETER = RELAXATION MODULUS
UNIT OF MEASURE = PSI *10¹
100.00
80.00
60.00
40.00
20.00
0.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
ANB 3066 PROPELLANT(ANB) RELAXATION MODULUS AT 1000 SEC 77 DEG F UNLND CYNS 1%

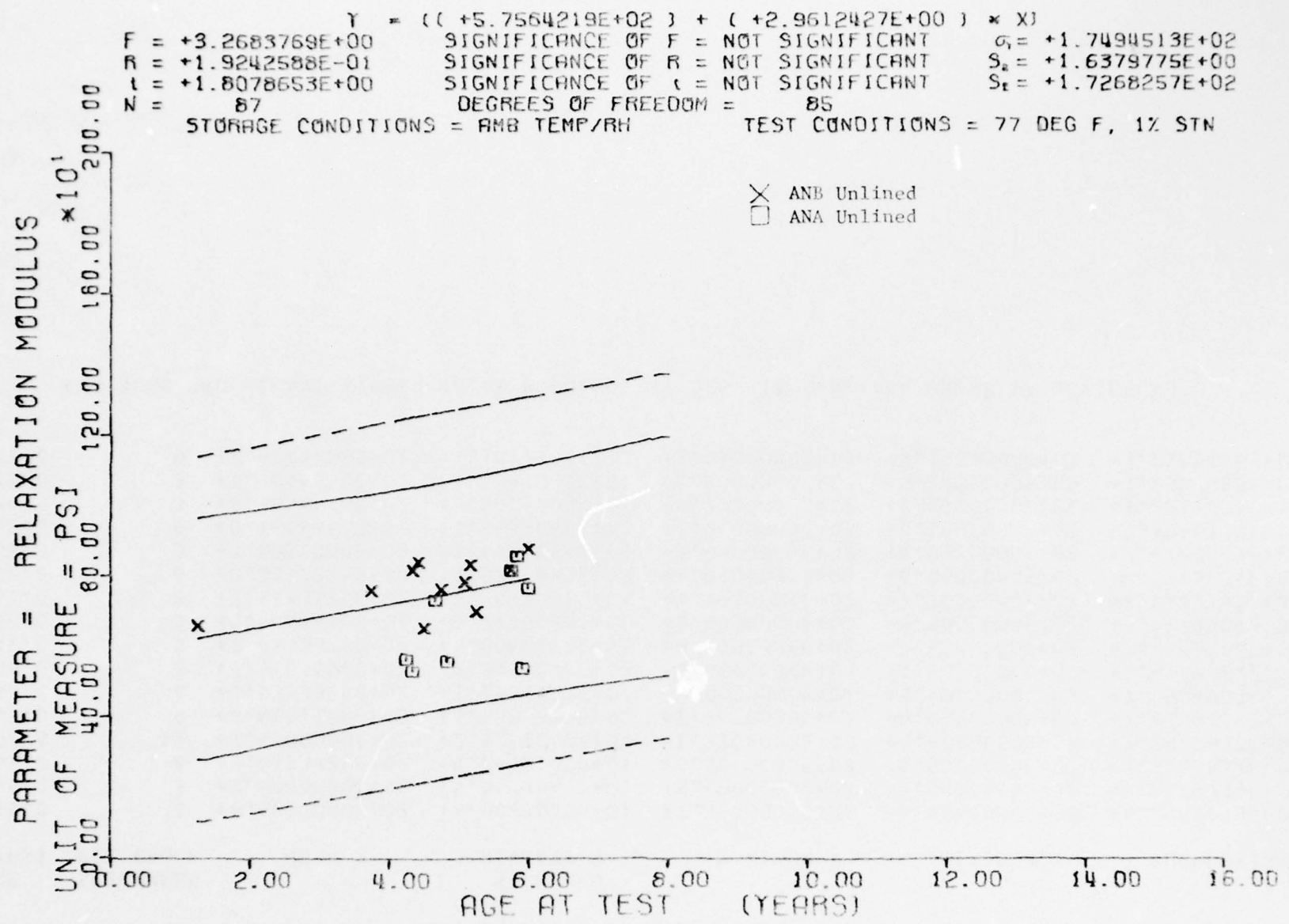
Figure 6-4

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
15.0	3	+4.3000000E+02	+3.4641016E+01	+4.7000000E+02	+4.1000000E+02	+4.0993920E+02
45.0	3	+4.4000000E+02	+2.6457513E+01	+4.6000000E+02	+4.1000000E+02	+4.6454077E+02
52.2	9	+4.5888867E+02	+1.1638075E+02	+6.9000000E+02	+2.8000000E+02	+4.7938110E+02
53.0	9	+5.1333325E+02	+9.1651513E+01	+6.3000000E+02	+3.7000000E+02	+4.8150122E+02
54.0	6	+4.0500000E+02	+4.7644516E+01	+4.7000000E+02	+3.6000000E+02	+4.8362133E+02
57.0	3	+4.3666650E+02	+4.7258156E+01	+4.9000000E+02	+4.0000000E+02	+4.8998144E+02
61.0	9	+4.9666650E+02	+1.5275252E+01	+5.1000000E+02	+4.8000000E+02	+4.9846166E+02
62.0	6	+5.4166650E+02	+1.7638537E+02	+7.2000000E+02	+3.8000000E+02	+5.0058178E+02
63.0	3	+4.5000000E+02	+1.7320508E+01	+4.6000000E+02	+4.3000000E+02	+5.0270166E+02
69.0	3	+4.9000000E+02	+6.0827625E+01	+5.6000000E+02	+4.5000000E+02	+5.1542211E+02
72.0	6	+5.6166650E+02	+2.4832774E+01	+5.9000000E+02	+5.4000000E+02	+5.2178222E+02

ANT 3060 PROPELLANT(ANB) RELAXATION MODULUS AT 1000 SEC 77 DEG F UNLND CYNS 1%



ANB 3066 PROPELLANT STRESS RELAX MODULUS, 77 DEG, 1% STN, ANA UNLND VS ANB UNLND
10 Sec

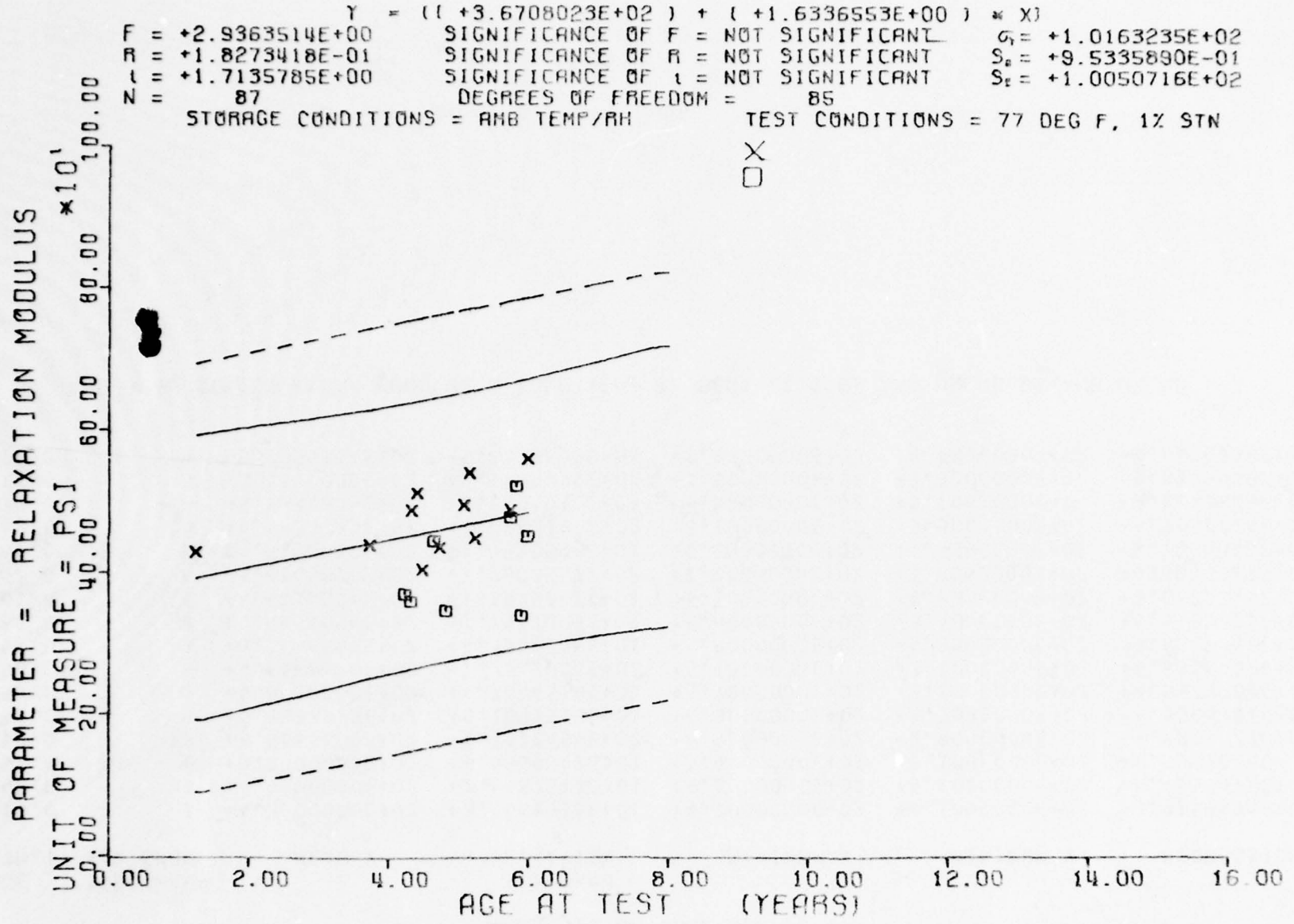
Figure 6-5

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
15.0	3	+6.6000000E+02	+6.0827625E+01	+7.3000000E+02	+6.2000000E+02	+6.2006079E+02
45.0	3	+7.6000000E+02	+5.5677643E+01	+8.1000000E+02	+7.0000000E+02	+7.0889794E+02
51.0	6	+5.6333325E+02	+9.2448183E+01	+6.8000000E+02	+4.5000000E+02	+7.2666552E+02
52.0	12	+7.4500000E+02	+2.1241040E+02	+1.1700000E+03	+4.8000000E+02	+7.2962670E+02
53.0	9	+8.4111108E+02	+1.5885877E+02	+1.0400000E+03	+6.4000000E+02	+7.3258789E+02
54.0	6	+6.5333325E+02	+1.1552777E+02	+8.0000000E+02	+5.4000000E+02	+7.3554907E+02
56.0	6	+7.3166650E+02	+2.3945076E+02	+1.0400000E+03	+4.7000000E+02	+7.4147167E+02
57.0	3	+7.6333325E+02	+6.8068592E+01	+8.4000000E+02	+7.1000000E+02	+7.4443286E+02
58.0	3	+5.5666650E+02	+5.7735026E+00	+5.6000000E+02	+5.5000000E+02	+7.4739404E+02
61.0	3	+7.8333325E+02	+1.1547005E+01	+7.9000000E+02	+7.7000000E+02	+7.5627883E+02
62.0	6	+8.3333325E+02	+2.5271855E+02	+1.0900000E+03	+6.0000000E+02	+7.5923901E+02
63.0	3	+7.0000000E+02	+3.4641016E+01	+7.4000000E+02	+6.8000000E+02	+7.6220043E+02
69.0	9	+8.1666650E+02	+1.8439088E+02	+1.0400000E+03	+6.1000000E+02	+7.7996777E+02
70.0	3	+8.5666650E+02	+5.5075705E+01	+9.2000000E+02	+8.2000000E+02	+7.8292895E+02
71.0	3	+5.3666650E+02	+1.1547005E+01	+5.5000000E+02	+5.3000000E+02	+7.8589038E+02
72.0	9	+8.4111108E+02	+1.1072990E+02	+1.0100000E+03	+7.1000000E+02	+7.8885156E+02

ANB 3066 PROPELLANT STRESS RELAX MODULUS, 77 DEG, 1% STN, ANA UNLND VS ANB UNLND



ANB 3066 STRESS RELAX MODULUS @ 1000 SEC, 77 DEG; 1% STN, ANA UNLND VS ANB UNLND

Figure 6-6

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
15.0	3	+4.3000000E+02	+3.4641016E+01	+4.7000000E+02	+4.1000000E+02	+3.9158496E+02
45.0	3	+4.4000000E+02	+2.6457513E+01	+4.6000000E+02	+4.1000000E+02	+4.4059472E+02
51.0	6	+3.7000000E+02	+5.6568542E+01	+4.4000000E+02	+3.1000000E+02	+4.5039648E+02
52.0	12	+4.5666650E+02	+1.1578454E+02	+6.9000000E+02	+2.8000000E+02	+4.5203027E+02
53.0	9	+5.1333325E+02	+9.1651513E+01	+6.3000000E+02	+3.7000000E+02	+4.5366381E+02
54.0	6	+4.0500000E+02	+4.7644516E+01	+4.7000000E+02	+3.6000000E+02	+4.5529760E+02
56.0	6	+4.4666650E+02	+1.2242004E+02	+6.1000000E+02	+3.1000000E+02	+4.5856469E+02
57.0	3	+4.3666650E+02	+4.7258156E+01	+4.9000000E+02	+4.0000000E+02	+4.6019848E+02
58.0	3	+3.4666650E+02	+1.1547005E+01	+3.6000000E+02	+3.4000000E+02	+4.6183203E+02
61.0	3	+4.9666650E+02	+1.5275252E+01	+5.1000000E+02	+4.8000000E+02	+4.6673315E+02
62.0	6	+5.4166650E+02	+1.7803557E+02	+7.2000000E+02	+3.8000000E+02	+4.6836669E+02
63.0	3	+4.5000000E+02	+1.7320508E+01	+4.6000000E+02	+4.3000000E+02	+4.7000048E+02
69.0	9	+4.8333325E+02	+1.0862780E+02	+6.1000000E+02	+3.5000000E+02	+4.7980224E+02
70.0	3	+5.2333325E+02	+2.3094010E+01	+5.5000000E+02	+5.1000000E+02	+4.8143603E+02
71.0	3	+3.4000000E+02	+9.9999999E+00	+3.5000000E+02	+3.3000000E+02	+4.8306958E+02
72.0	9	+5.2555541E+02	+5.8118652E+01	+5.9000000E+02	+4.4000000E+02	+4.8470336E+02

ANB 3066 STRESS RELAX MODULUS @ 1000 SEC, 77 DEG; 1% STN, ANA UNLND VS ANB UNLND

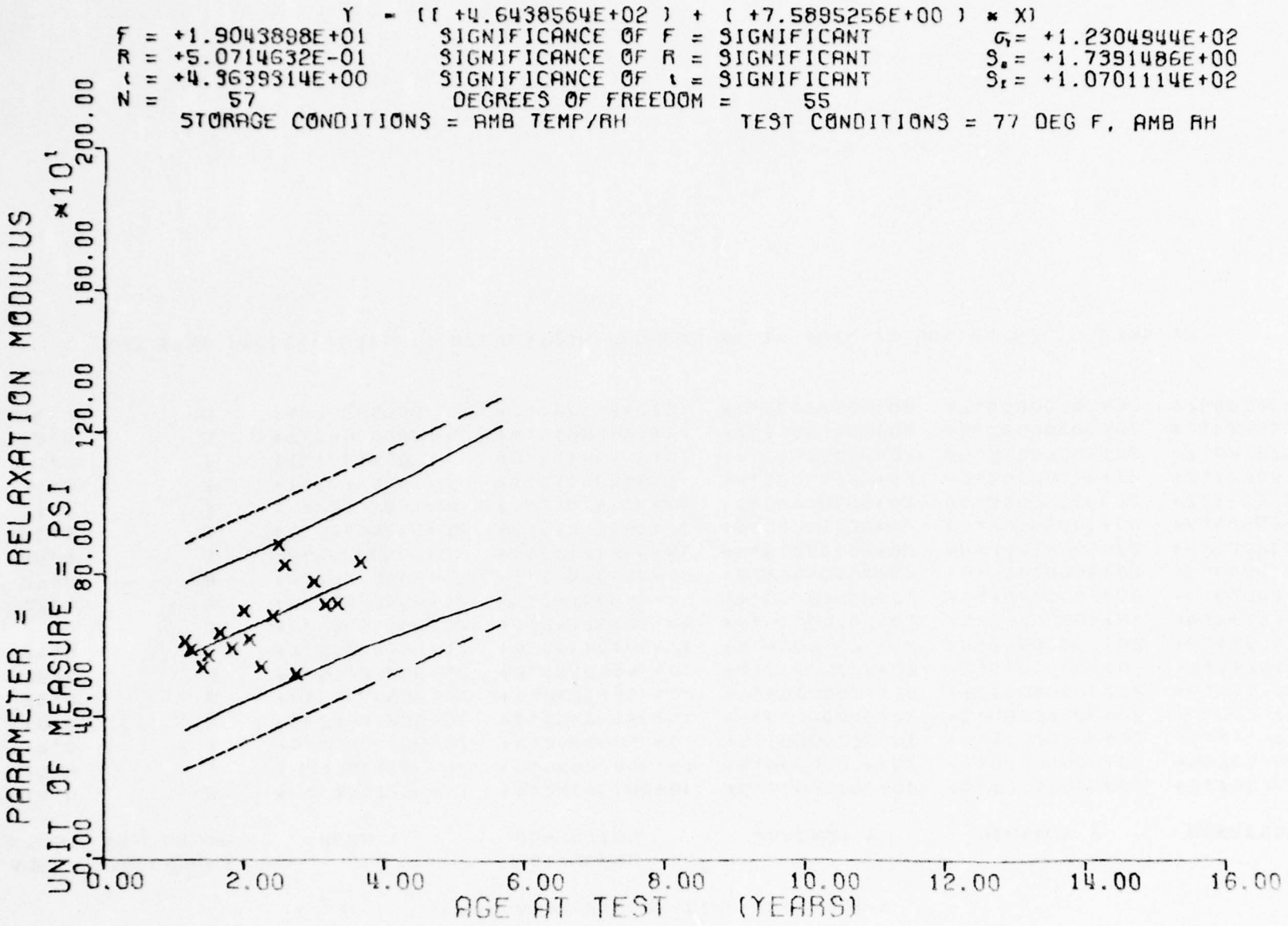

Y = (+4.6438564E+02) + (+7.5895256E+00) * X)
F = +1.9043898E+01 SIGNIFICANCE OF F = SIGNIFICANT σ1 = +1.2304944E+02
R = +5.0714632E-01 SIGNIFICANCE OF R = SIGNIFICANT Se = +1.7391486E+00
t = +4.3639314E+00 SIGNIFICANCE OF t = SIGNIFICANT Sr = +1.0701114E+02
N = 57 DEGREES OF FREEDOM = 55
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = 77 DEG F, AMB RH
PARAMETER = RELAXATION MODULUS
UNIT OF MEASURE = PSI *10¹
200.00
160.00
120.00
80.00
40.00
0.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
ANB 3066 PROPELLANT (ANT) RELAXATION MODULUS AT 10 SEC, 77 DEG F, LINED CTNS 1%

Figure 6-7

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
14.0	3	+5.1333325E+02	+4.0414518E+01	+6.5000000E+02	+5.7000000E+02	+5.7063891E+02
15.0	1	+5.9000000E+02	+0.0000000E+87	+5.9000000E+02	+5.9000000E+02	+5.7822851E+02
17.0	3	+5.4000000E+02	+4.3588989E+01	+5.9000000E+02	+5.1000000E+02	+5.9340747E+02
18.0	3	+5.7333325E+02	+1.1547005E+01	+5.8000000E+02	+5.6000000E+02	+6.0099707E+02
20.0	6	+6.3666650E+02	+1.2027745E+02	+7.9000000E+02	+5.1000000E+02	+6.1617602E+02
22.0	3	+5.9333325E+02	+3.0550504E+01	+6.2000000E+02	+5.6000000E+02	+6.3135498E+02
24.0	3	+7.0000000E+02	+3.4641016E+01	+7.4000000E+02	+6.8000000E+02	+6.4653417E+02
25.0	3	+6.2000000E+02	+4.3588989E+01	+6.5000000E+02	+5.7000000E+02	+6.5412377E+02
27.0	3	+5.4333325E+02	+5.7735026E+00	+5.5000000E+02	+5.4000000E+02	+6.6930273E+02
29.0	8	+6.8625000E+02	+1.0568653E+02	+8.2000000E+02	+5.3000000E+02	+6.8448168E+02
30.0	3	+8.8666650E+02	+6.0277137E+01	+9.5000000E+02	+8.3000000E+02	+6.9207128E+02
31.0	3	+8.3000000E+02	+6.5574385E+01	+9.0000000E+02	+7.7000000E+02	+6.9966088E+02
33.0	3	+6.2333325E+02	+1.5307950E+02	+7.0000000E+02	+4.3000000E+02	+7.1483984E+02
36.0	3	+7.8333325E+02	+3.5118845E+01	+8.2000000E+02	+7.5000000E+02	+7.3760939E+02
38.0	3	+7.1666650E+02	+3.5118845E+01	+7.5000000E+02	+6.8000000E+02	+7.5278759E+02
40.0	3	+7.2000000E+02	+4.5899999E+01	+7.7000000E+02	+6.7000000E+02	+7.6796655E+02
44.0	3	+8.3666650E+02	+7.7674534E+01	+9.0000000E+02	+7.5000000E+02	+7.9832470E+02

ANB 3066 PROPELLANT(ANT) RELAXATION MODULUS AT 10 SEC, 77 DEG F, LINED CTNS 1%

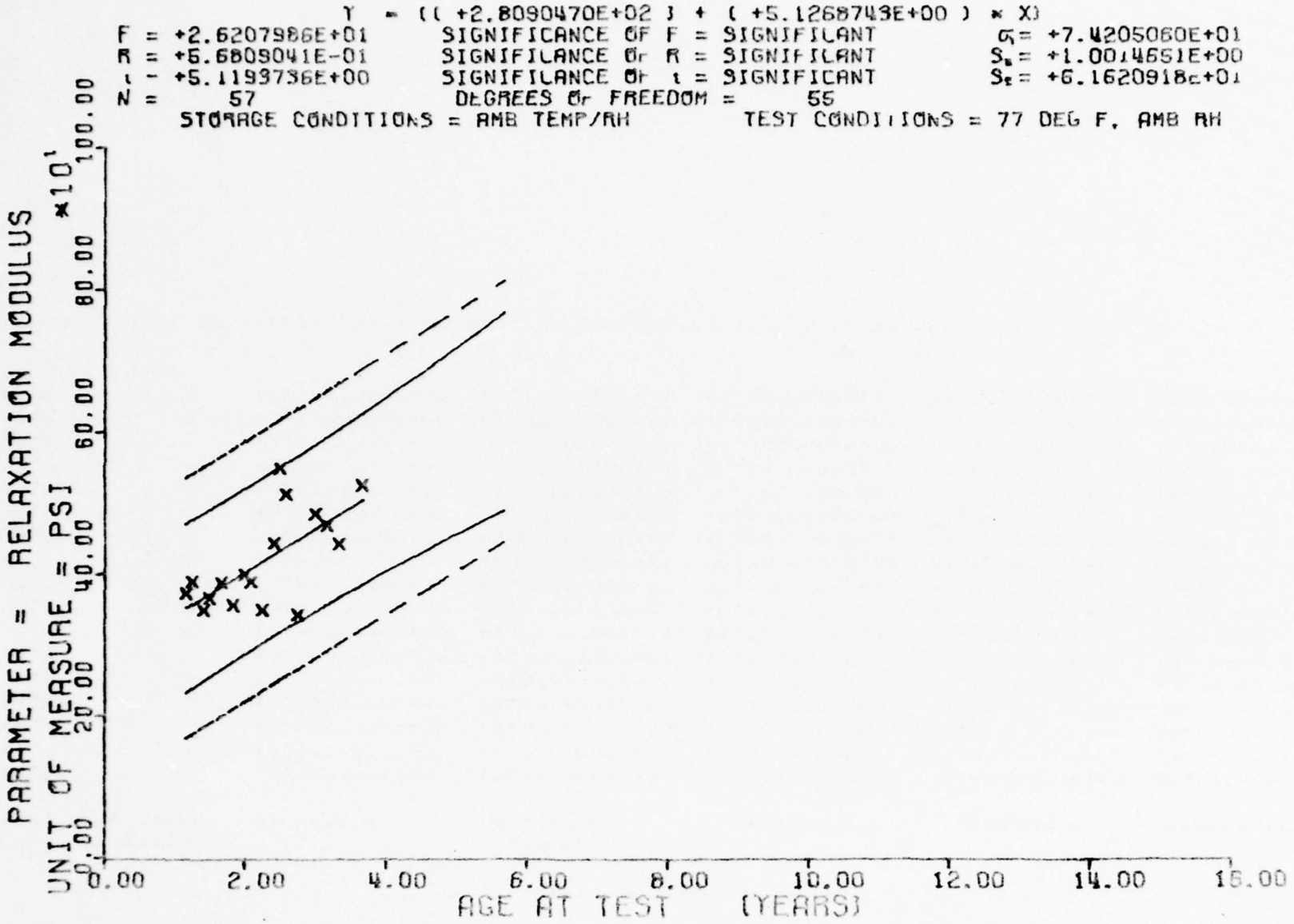

Y = ((+2.8090470E+02) + (+5.1268743E+00) * X)
F = +2.6207986E+01 SIGNIFICANCE OF F = SIGNIFICANT σ = +7.4205060E+01
R = +5.6809041E-01 SIGNIFICANCE OF R = SIGNIFICANT S = +1.0014651E+00
t = +5.1193736E+00 SIGNIFICANCE OF t = SIGNIFICANT S = +6.1620918E+01
N = 57 DEGREES OF FREEDOM = 55
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = 77 DEG F, AMB RH
PARAMETER = RELAXATION MODULUS
UNIT OF MEASURE = PSI *10¹
100.00
80.00
60.00
40.00
20.00
0.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
ANB 3066 PROPELLANT(ANT) RELAXATION MODULUS AT 1000 SEC, 77 DEG F, LND CTNS 1%

Figure 6-8

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
14.0	3	+3.7333335E+02	+3.0550504E+01	+4.0000000E+02	+3.4000000E+02	+3.5268090E+02
15.0	1	+4.0000000E+02	+0.0000000E+00	+4.0000000E+02	+4.0000000E+02	+3.5780761E+02
17.0	3	+3.5000000E+02	+2.0000000E+01	+3.7000000E+02	+3.3000000E+02	+3.6836152E+02
18.0	3	+3.5666650E+02	+5.7735026E+00	+3.6000000E+02	+3.5000000E+02	+3.7318823E+02
20.0	6	+3.8833325E+02	+4.4007575E+01	+4.4000000E+02	+3.4000000E+02	+3.8344217E+02
22.0	3	+3.5666650E+02	+1.5275252E+01	+3.7000000E+02	+3.4000000E+02	+3.9369580E+02
24.0	3	+4.0000000E+02	+1.0000000E+01	+4.0000000E+02	+3.9000000E+02	+4.0394946E+02
25.0	3	+3.9333333E+02	+2.6457513E+01	+4.1000000E+02	+3.6000000E+02	+4.0907641E+02
27.0	3	+3.5333333E+02	+2.0000000E+01	+3.7000000E+02	+3.5000000E+02	+4.1932997E+02
28.0	8	+4.0375000E+02	+6.9680392E+01	+5.3000000E+02	+3.5000000E+02	+4.2958398E+02
30.0	3	+5.5000000E+02	+2.0999999E+01	+5.8000000E+02	+5.2000000E+02	+4.3471093E+02
31.0	3	+5.1333325E+02	+4.5092497E+01	+5.6000000E+02	+4.7000000E+02	+4.3983764E+02
33.0	3	+3.4333325E+02	+1.0115993E+02	+4.6000000E+02	+2.8000000E+02	+4.5009155E+02
36.0	3	+4.9666650E+02	+2.5156114E+01	+5.1000000E+02	+4.6000000E+02	+4.6547216E+02
38.0	3	+4.7000000E+02	+1.0999999E+01	+4.8000000E+02	+4.5000000E+02	+4.7572583E+02
40.0	3	+4.4333325E+02	+3.0550504E+01	+4.7000000E+02	+4.1000000E+02	+4.8597949E+02
44.0	3	+5.2666650E+02	+5.1316014E+01	+5.7000000E+02	+4.7000000E+02	+5.0648706E+02

AGE 3966 PROPELLANT(ANT) RELAXATION MODULUS AT 1000 SEC, 77 DEG F, IND CTNS 1%

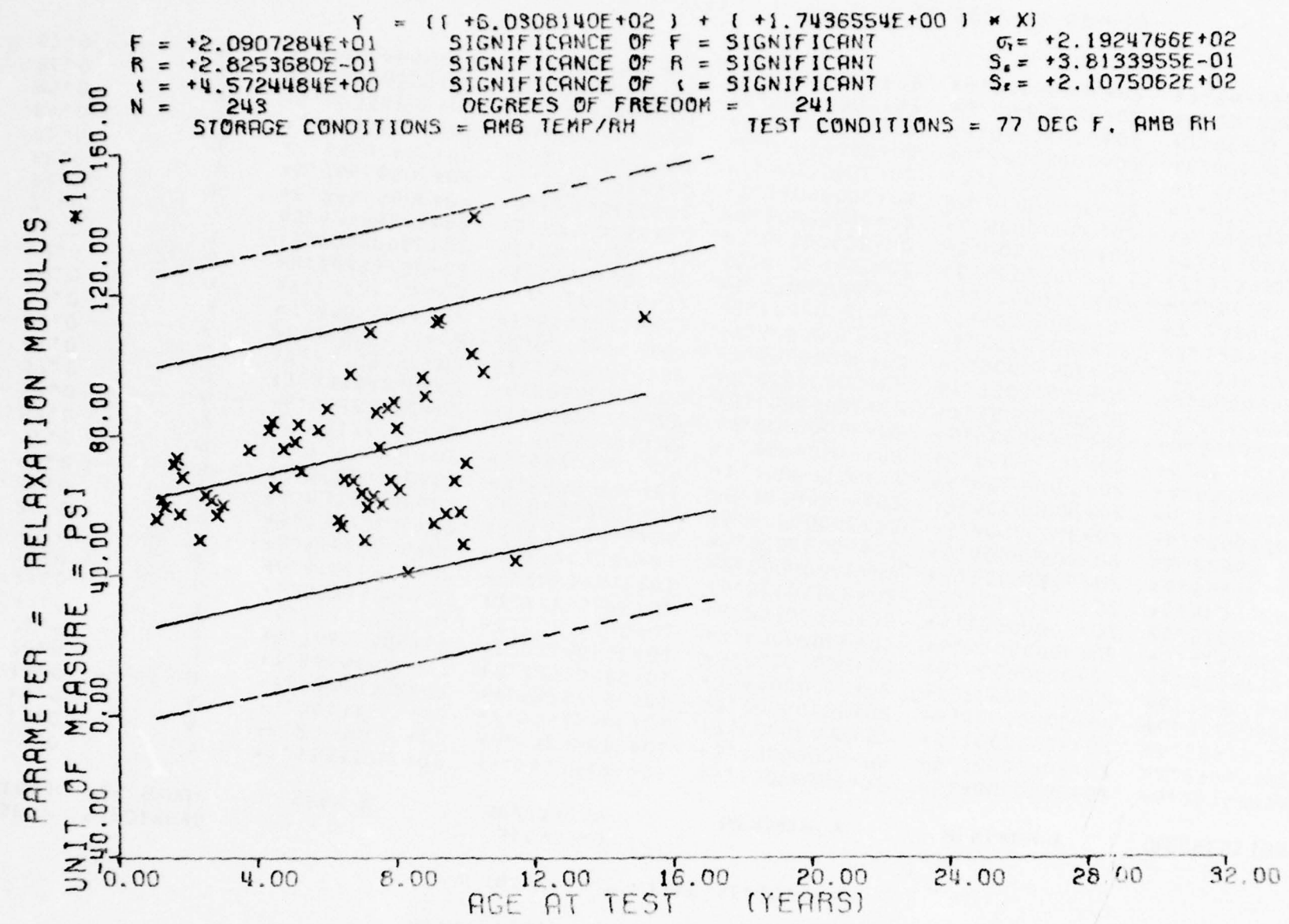

Y = ((+6.0808140E+02) + (+1.7436554E+00) * X)
F = +2.0907284E+01 SIGNIFICANCE OF F = SIGNIFICANT σ1 = +2.1924766E+02
R = +2.8253680E-01 SIGNIFICANCE OF R = SIGNIFICANT Se = +3.8133955E-01
t = +4.5724484E+00 SIGNIFICANCE OF t = SIGNIFICANT Sε = +2.1075062E+02
N = 243 DEGREES OF FREEDOM = 241
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = 77 DEG F, AMB RH
PARAMETER = RELAXATION MODULUS
UNIT OF MEASURE = PSI *10¹
160.00
120.00
80.00
40.00
0.00
-40.00
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
ANB 3066 PROPELLANT (ALL ANB) STRESS RELAXATION MODULUS @ 10 SEC, 1% STRAIN

Figure 6-9

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
13.0	3	+5.6333325E+02	+4.1633319E+01	+6.1000000E+02	+5.3000000E+02	+6.2574877E+02
15.0	6	+6.2000000E+02	+5.9329587E+01	+7.3000000E+02	+5.7000000E+02	+6.2923608E+02
16.0	6	+5.9833325E+02	+7.9351533E+01	+7.0000000E+02	+5.1000000E+02	+6.3097973E+02
19.0	3	+7.2000000E+02	+4.5825756E+01	+7.7000000E+02	+6.8000000E+02	+6.3621069E+02
20.0	3	+7.3666650E+02	+3.7859388E+01	+7.8000000E+02	+7.1000000E+02	+6.3795434E+02
21.0	3	+5.7666650E+02	+2.0816659E+01	+6.0000000E+02	+5.6000000E+02	+6.3969799E+02
22.0	3	+6.8333325E+02	+2.0816659E+01	+7.0000000E+02	+6.6000000E+02	+6.4144165E+02
28.0	6	+5.0333325E+02	+7.7373552E+01	+6.2000000E+02	+4.1000000E+02	+6.5190356E+02
30.0	6	+6.3166650E+02	+4.7081489E+01	+6.9000000E+02	+5.7000000E+02	+6.5539086E+02
32.0	6	+6.1666650E+02	+7.3120904E+01	+7.2000000E+02	+5.1000000E+02	+6.5887817E+02
34.0	3	+5.7333325E+02	+1.5275252E+01	+5.9000000E+02	+5.6000000E+02	+6.6236547E+02
36.0	3	+6.0333325E+02	+8.0208062E+01	+6.8000000E+02	+5.2000000E+02	+6.6585278E+02
45.0	3	+7.6000000E+02	+5.5677643E+01	+8.1000000E+02	+7.0000000E+02	+6.8154589E+02
52.0	9	+8.1666650E+02	+1.9570385E+02	+1.1700000E+03	+4.9000000E+02	+6.9375146E+02
53.0	9	+8.4111108E+02	+1.5885377E+02	+1.0400000E+03	+6.4000000E+02	+6.9549511E+02
54.0	6	+6.5333325E+02	+1.1552777E+02	+8.0000000E+02	+5.4000000E+02	+6.9723876E+02
57.0	3	+7.6333325E+02	+6.8068592E+01	+8.4000000E+02	+7.1000000E+02	+7.0246972E+02
61.0	3	+7.8333325E+02	+1.1547005E+01	+7.9000000E+02	+7.7000000E+02	+7.0944433E+02
62.0	6	+8.3333325E+02	+2.5271855E+02	+1.0900000E+03	+6.0000000E+02	+7.1118798E+02
63.0	3	+7.0000000E+02	+3.4641016E+01	+7.4000000E+02	+6.8000000E+02	+7.1293164E+02
69.0	3	+8.1666650E+02	+8.6216781E+01	+9.1000000E+02	+7.4000000E+02	+7.2339355E+02
72.0	6	+8.7833325E+02	+1.1940128E+02	+1.0100000E+03	+7.1000000E+02	+7.2862451E+02
76.0	3	+5.6000000E+02	+1.9999999E+01	+5.8000000E+02	+5.4000000E+02	+7.3559912E+02
77.0	3	+5.4333325E+02	+5.7735026E+00	+5.5000000E+02	+5.4000000E+02	+7.3734277E+02
78.0	6	+6.7666650E+02	+2.0655911E+01	+7.1000000E+02	+6.5000000E+02	+7.3908642E+02
80.0	3	+9.7666650E+02	+1.1590225E+02	+1.1100000E+03	+9.0000000E+02	+7.4257373E+02
81.0	3	+6.7333325E+02	+8.1445278E+01	+7.3000000E+02	+5.8000000E+02	+7.4431738E+02
84.0	3	+6.3666650E+02	+3.0550504E+01	+6.7000000E+02	+6.1000000E+02	+7.4954833E+02
85.0	3	+5.0333325E+02	+2.3094010E+01	+5.3000000E+02	+4.9000000E+02	+7.5129199E+02
86.0	3	+5.9666650E+02	+5.5075705E+01	+6.5000000E+02	+5.4000000E+02	+7.5303564E+02
87.0	3	+1.0966665E+03	+1.6072751E+02	+1.2800000E+03	+9.8000000E+02	+7.5477929E+02

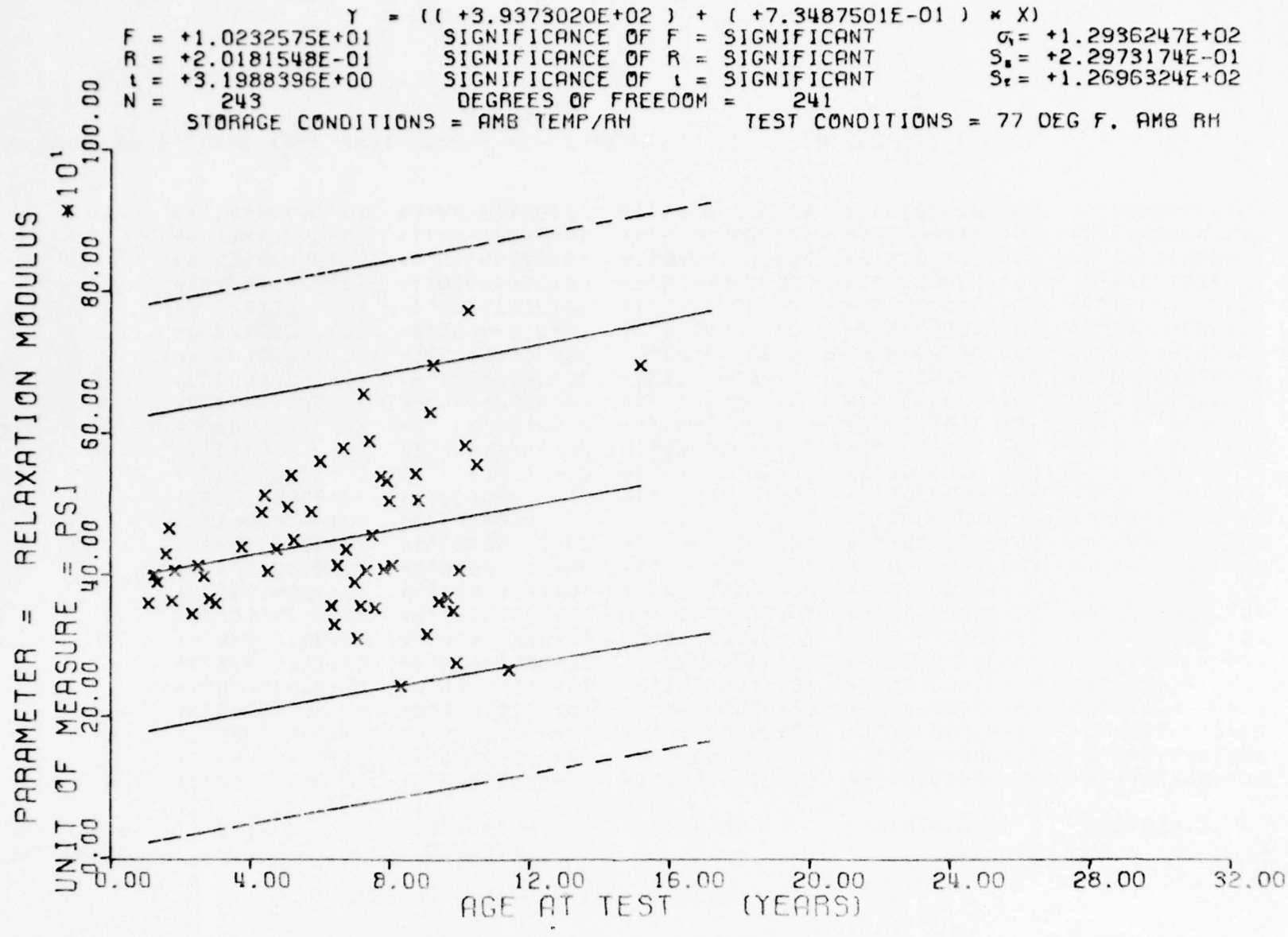
ANB 3066 PROPELLANT (ALL ANB) STRESS RELAXATION MODULUS @ 10 SEC, 1% STRAIN

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
88.0	9	+6.2777778E+02	+2.3215177E+02	+1.1300000E+03	+4.6000000E+02	+7.5652294E+02
89.0	6	+8.6833325E+02	+1.0796604E+02	+9.9000000E+02	+7.0000000E+02	+7.5826660E+02
90.0	3	+7.6666650E+02	+5.5075705E+01	+8.3000000E+02	+7.3000000E+02	+7.6001025E+02
91.0	3	+6.0666650E+02	+2.3094010E+01	+6.2000000E+02	+5.8000000E+02	+7.6175390E+02
93.0	3	+8.8000000E+02	+2.9999999E+01	+9.1000000E+02	+8.5000000E+02	+7.6524121E+02
94.0	9	+6.7444433E+02	+1.0794803E+02	+8.1000000E+02	+5.2000000E+02	+7.6698486E+02
95.0	3	+8.9666650E+02	+5.0332229E+01	+9.5000000E+02	+8.5000000E+02	+7.6872851E+02
96.0	6	+8.2333325E+02	+3.5023801E+01	+8.7000000E+02	+7.7000000E+02	+7.7047216E+02
97.0	3	+6.4666650E+02	+4.1633319E+01	+6.8000000E+02	+6.0000000E+02	+7.7221582E+02
100.0	3	+4.1000000E+02	+9.9999999E+00	+4.2000000E+02	+4.0000000E+02	+7.7744677E+02
105.0	6	+9.6666650E+02	+1.9469634E+02	+1.2000000E+03	+7.1000000E+02	+7.8616503E+02
106.0	3	+9.1333325E+02	+2.1221058E+02	+1.1500000E+03	+7.4000000E+02	+7.8790869E+02
109.0	3	+5.5000000E+02	+0.0000000E+75	+5.5000000E+02	+5.5000000E+02	+7.9313964E+02
110.0	3	+1.1233332E+03	+1.7387735E+02	+1.3200000E+03	+9.9000000E+02	+7.9488330E+02
111.0	6	+1.1316665E+03	+1.7904375E+02	+1.4300000E+03	+9.3000000E+02	+7.9662695E+02
113.0	12	+5.7833325E+02	+2.3482424E+02	+1.0000000E+03	+3.7000000E+02	+8.0011425E+02
116.0	6	+6.7166650E+02	+1.8411047E+02	+9.9000000E+02	+4.9000000E+02	+8.0534521E+02
118.0	3	+5.8333325E+02	+3.7859388E+01	+6.1000000E+02	+5.4000000E+02	+8.0883251E+02
119.0	3	+4.9000000E+02	+9.9999999E+00	+5.0000000E+02	+4.8000000E+02	+8.1057617E+02
120.0	3	+7.2333325E+02	+5.8594652E+01	+7.9000000E+02	+6.8000000E+02	+8.1231982E+02
122.0	3	+1.0333332E+03	+7.5718777E+01	+1.1200000E+03	+9.8000000E+02	+8.1580737E+02
123.0	3	+1.4233332E+03	+1.0969655E+02	+1.5500000E+03	+1.3600000E+03	+8.1755102E+02
126.0	3	+9.8333325E+02	+4.0414518E+01	+1.0200000E+03	+9.4000000E+02	+8.2278198E+02
137.0	3	+4.4333325E+02	+1.1547005E+01	+4.5000000E+02	+4.3000000E+02	+8.4196215E+02
152.0	3	+1.1366665E+03	+2.2810816E+02	+1.4000000E+03	+1.0000000E+03	+9.2042651E+02

ANB 3066 PROPELLANT (ALL ANB) STRESS RELAXATION MODULUS @ 10 SEC, 1% STRAIN



ANB 3066 PROPELLANT (ALL ANB) STRESS RELAXATION MODULUS @ 1000 SEC, 1% STRAIN

Figure 6-10

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
13.0	3	+3.6000000E+02	+1.7320508E+01	+3.8000000E+02	+3.5000000E+02	+4.0328344E+02
15.0	6	+4.0000000E+02	+4.2895221E+01	+4.7000000E+02	+3.5000000E+02	+4.0475317E+02
16.0	5	+3.9000000E+02	+4.1472882E+01	+4.4000000E+02	+3.5000000E+02	+4.0548803E+02
19.0	3	+4.3000000E+02	+1.7320508E+01	+4.5000000E+02	+4.2000000E+02	+4.0769262E+02
20.0	3	+4.6666650E+02	+2.8867513E+01	+5.0000000E+02	+4.5000000E+02	+4.0842749E+02
21.0	3	+3.6333325E+02	+2.3094010E+01	+3.9000000E+02	+3.5000000E+02	+4.0916235E+02
22.0	3	+4.0666650E+02	+1.5275252E+01	+4.2000000E+02	+3.9000000E+02	+4.0989721E+02
28.0	6	+3.4500000E+02	+4.3243496E+01	+4.1000000E+02	+2.9000000E+02	+4.1430664E+02
30.0	6	+4.1333325E+02	+2.7325202E+01	+4.4000000E+02	+3.8000000E+02	+4.1577636E+02
32.0	6	+3.9833325E+02	+4.8751068E+01	+4.7000000E+02	+3.3000000E+02	+4.1724609E+02
34.0	3	+3.6666650E+02	+2.5166114E+01	+3.9000000E+02	+3.4000000E+02	+4.1871582E+02
36.0	3	+3.6000000E+02	+6.2449979E+01	+4.3000000E+02	+3.1000000E+02	+4.2018554E+02
45.0	3	+4.4000000E+02	+2.6457513E+01	+4.6000000E+02	+4.1000000E+02	+4.2679956E+02
52.0	9	+4.8888867E+02	+1.1688075E+02	+6.9000000E+02	+2.8000000E+02	+4.3194360E+02
53.0	3	+5.1333325E+02	+9.1651513E+01	+6.3000000E+02	+3.7000000E+02	+4.3267846E+02
54.0	6	+4.0500000E+02	+4.7644516E+01	+4.7000000E+02	+3.6000000E+02	+4.3341333E+02
57.0	3	+4.3666650E+02	+4.7258156E+01	+4.9000000E+02	+4.0000000E+02	+4.3561791E+02
61.0	3	+4.9666650E+02	+1.5275252E+01	+5.1000000E+02	+4.8000000E+02	+4.3855737E+02
62.0	6	+5.4166650E+02	+1.7803557E+02	+7.2000000E+02	+3.8000000E+02	+4.3929223E+02
63.0	3	+4.5000000E+02	+1.7320508E+01	+4.6000000E+02	+4.3000000E+02	+4.4002709E+02
69.0	3	+4.9000000E+02	+6.0827625E+01	+5.6000000E+02	+4.5000000E+02	+4.4443652E+02
72.0	6	+5.6166650E+02	+2.4832774E+01	+5.9000000E+02	+5.4000000E+02	+4.4664111E+02
76.0	3	+3.5666650E+02	+1.5275252E+01	+3.7000000E+02	+3.4000000E+02	+4.4958056E+02
77.0	3	+3.3000000E+02	+0.0000000E+95	+3.3000000E+02	+3.3000000E+02	+4.5031542E+02
78.0	6	+4.1333325E+02	+8.1649658E+00	+4.2000000E+02	+4.0000000E+02	+4.5105029E+02
80.0	3	+5.8000000E+02	+7.8102496E+01	+6.7000000E+02	+5.3000000E+02	+4.5252001E+02
81.0	3	+4.3666650E+02	+6.0277137E+01	+5.0000000E+02	+3.8000000E+02	+4.5325488E+02
84.0	3	+3.9000000E+02	+9.9999999E+00	+4.0000000E+02	+3.8000000E+02	+4.5545947E+02
85.0	3	+3.1000000E+02	+9.9999999E+00	+3.2000000E+02	+3.0000000E+02	+4.5619458E+02
86.0	3	+3.5666650E+02	+3.2145502E+01	+3.8000000E+02	+3.2000000E+02	+4.5692964E+02
87.0	3	+4.5666650E+02	+8.9628864E+01	+7.6000000E+02	+4.0000000E+02	+4.5766430E+02

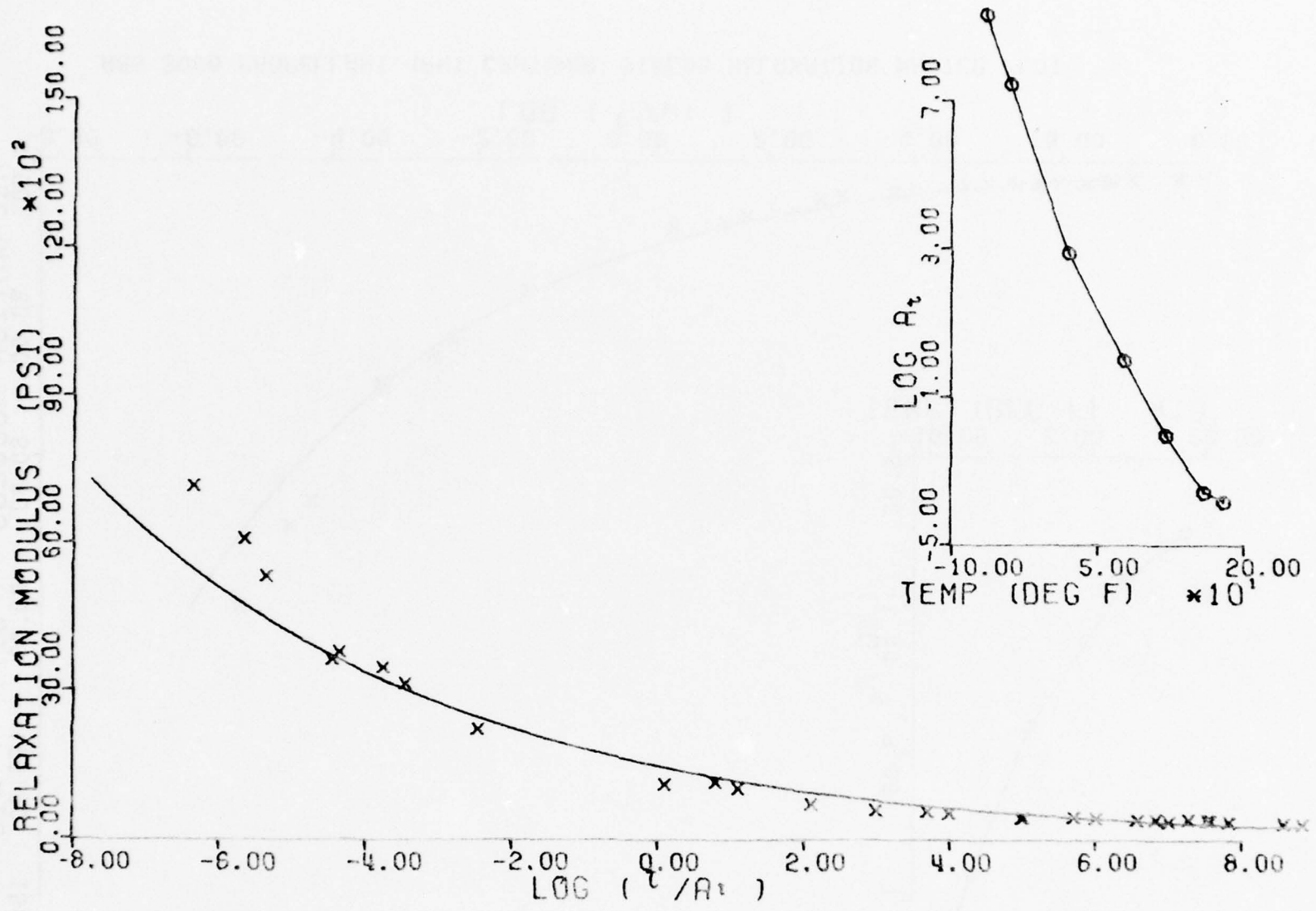
ANB 3066 PROPELLANT (ALL ANB) STRESS RELAXATION MODULUS @ 1000 SEC, 1% STRAIN

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

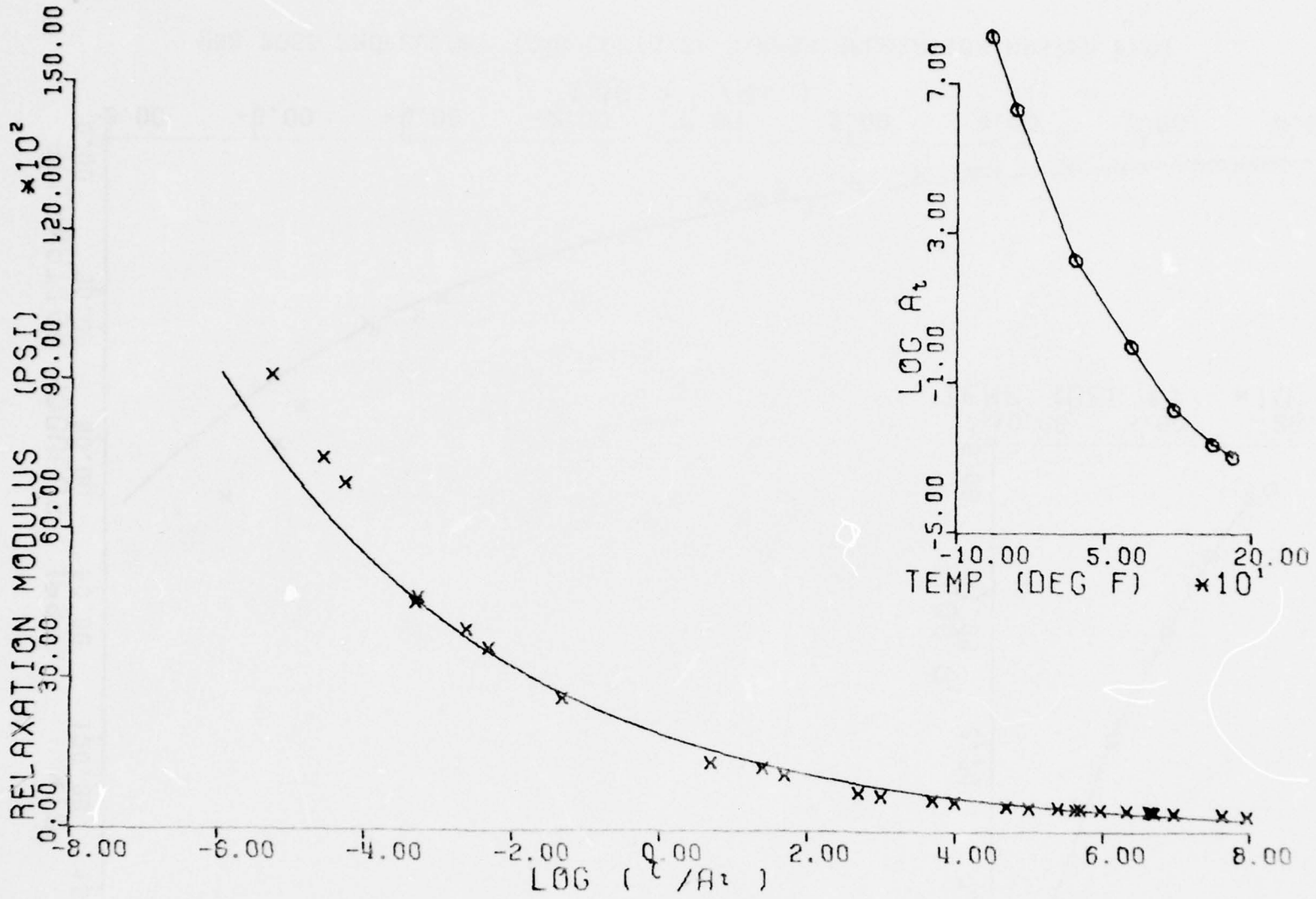
AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
88.0	9	+4.0666650E+02	+2.1071307E+02	+8.8000000E+02	+2.7000000E+02	+4.5839916E+02
89.0	6	+5.9000000E+02	+5.7965506E+01	+6.5000000E+02	+5.2000000E+02	+4.5913403E+02
90.0	3	+4.5666650E+02	+2.0816659E+01	+4.8000000E+02	+4.4000000E+02	+4.5986889E+02
91.0	3	+3.5333325E+02	+1.1547005E+01	+3.6000000E+02	+3.4000000E+02	+4.6060375E+02
93.0	3	+5.4000000E+02	+1.9999999E+01	+5.6000000E+02	+5.2000000E+02	+4.6207348E+02
94.0	9	+4.0777758E+02	+6.0781941E+01	+4.8000000E+02	+3.2000000E+02	+4.6280834E+02
95.0	3	+5.3333325E+02	+2.3094010E+01	+5.6000000E+02	+5.2000000E+02	+4.6354321E+02
96.0	6	+5.0500000E+02	+2.8809720E+01	+5.5000000E+02	+4.7000000E+02	+4.6427807E+02
97.0	3	+4.1333325E+02	+5.7735026E+00	+4.2000000E+02	+4.1000000E+02	+4.6501293E+02
100.0	3	+2.4333332E+02	+1.1547005E+01	+2.5000000E+02	+2.3000000E+02	+4.6721752E+02
105.0	6	+5.4333325E+02	+1.1724617E+02	+6.9000000E+02	+3.8000000E+02	+4.7089184E+02
106.0	3	+5.0666650E+02	+1.1590225E+02	+6.4000000E+02	+4.3000000E+02	+4.7162695E+02
109.0	3	+3.1666650E+02	+5.7735026E+00	+3.2000000E+02	+3.1000000E+02	+4.7383154E+02
110.0	3	+6.3000000E+02	+1.1269427E+02	+7.6000000E+02	+5.6000000E+02	+4.7456640E+02
111.0	6	+6.9666650E+02	+1.3952299E+02	+9.3000000E+02	+5.3000000E+02	+4.7530126E+02
113.0	12	+3.6250000E+02	+1.2700214E+02	+5.9000000E+02	+2.5000000E+02	+4.7677099E+02
116.0	6	+3.6833325E+02	+9.8268340E+01	+5.5000000E+02	+2.8000000E+02	+4.7897558E+02
118.0	3	+3.5000000E+02	+1.7320508E+01	+3.6000000E+02	+3.3000000E+02	+4.8044531E+02
119.0	3	+2.7666650E+02	+5.7735026E+00	+2.8000000E+02	+2.7000000E+02	+4.8118017E+02
120.0	3	+4.0666650E+02	+2.8867513E+01	+4.4000000E+02	+3.9000000E+02	+4.8191503E+02
122.0	3	+5.8333325E+02	+4.9328828E+01	+6.4000000E+02	+5.5000000E+02	+4.8338476E+02
123.0	3	+7.7333325E+02	+4.9328828E+01	+8.3000000E+02	+7.4000000E+02	+4.8411962E+02
126.0	3	+5.5666650E+02	+4.0414518E+01	+6.0000000E+02	+5.2000000E+02	+4.8632421E+02
137.0	3	+2.6666650E+02	+5.7735026E+00	+2.7000000E+02	+2.6000000E+02	+4.9440795E+02
182.0	3	+6.9666650E+02	+1.5885003E+02	+8.8000000E+02	+6.0000000E+02	+5.2747729E+02

ANB 3066 PROPELLANT (ALL ANB) STRESS RELAXATION MODULUS @ 1000 SEC, 1% STRAIN



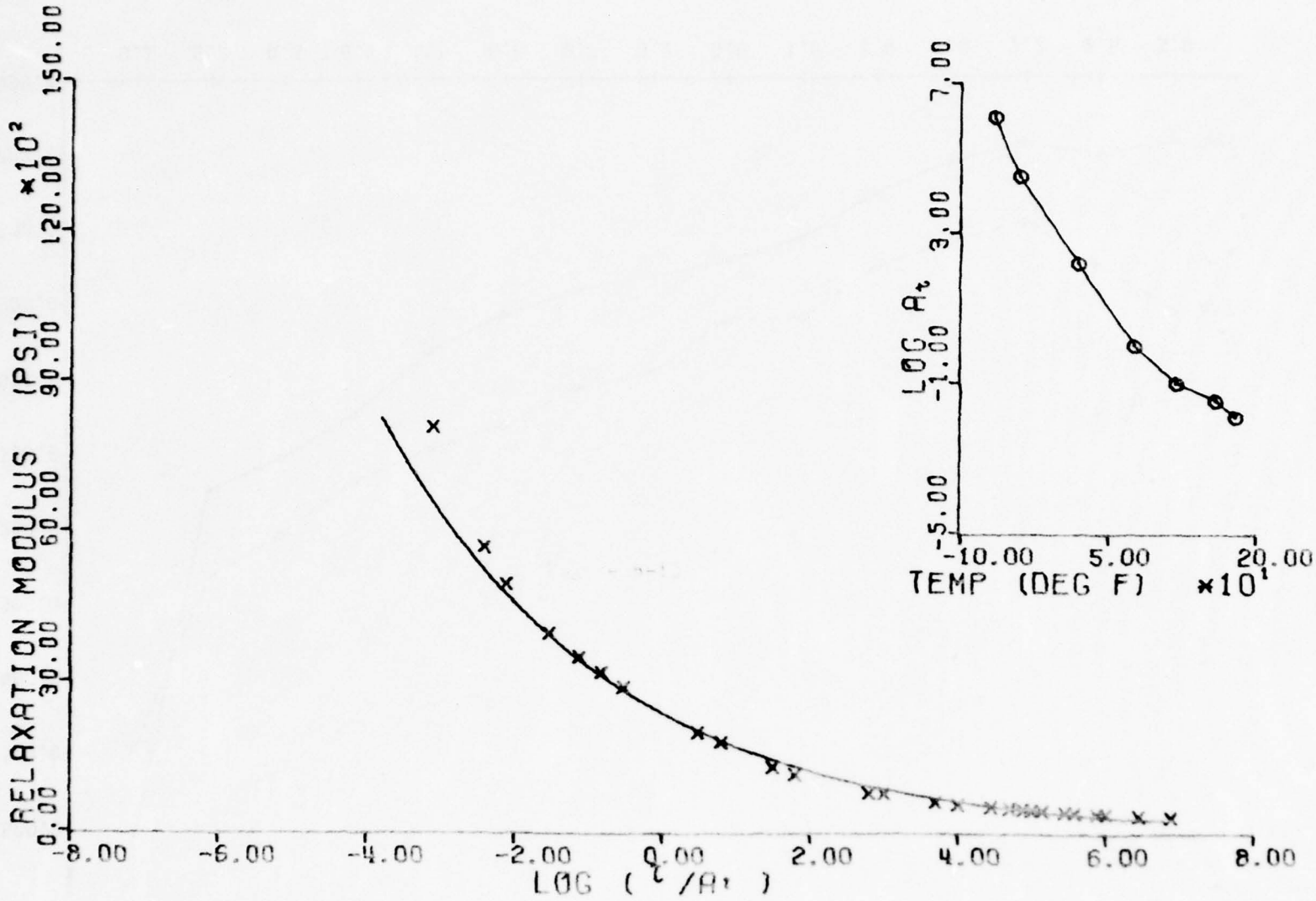
ANB 3066 PROPELLANT (ANB CARTONS) STRESS RELAXATION MASTER PLOT

Figure 6-11



ANB 3066 PROPELLANT (ANT CARTONS) STRESS RELAXATION MASTER PLOT

Figure 6-12



ANB 3066 PROPELLANT (ANA CARTONS) STRESS RELAXATION MASTER PLOT

Figure 6-13

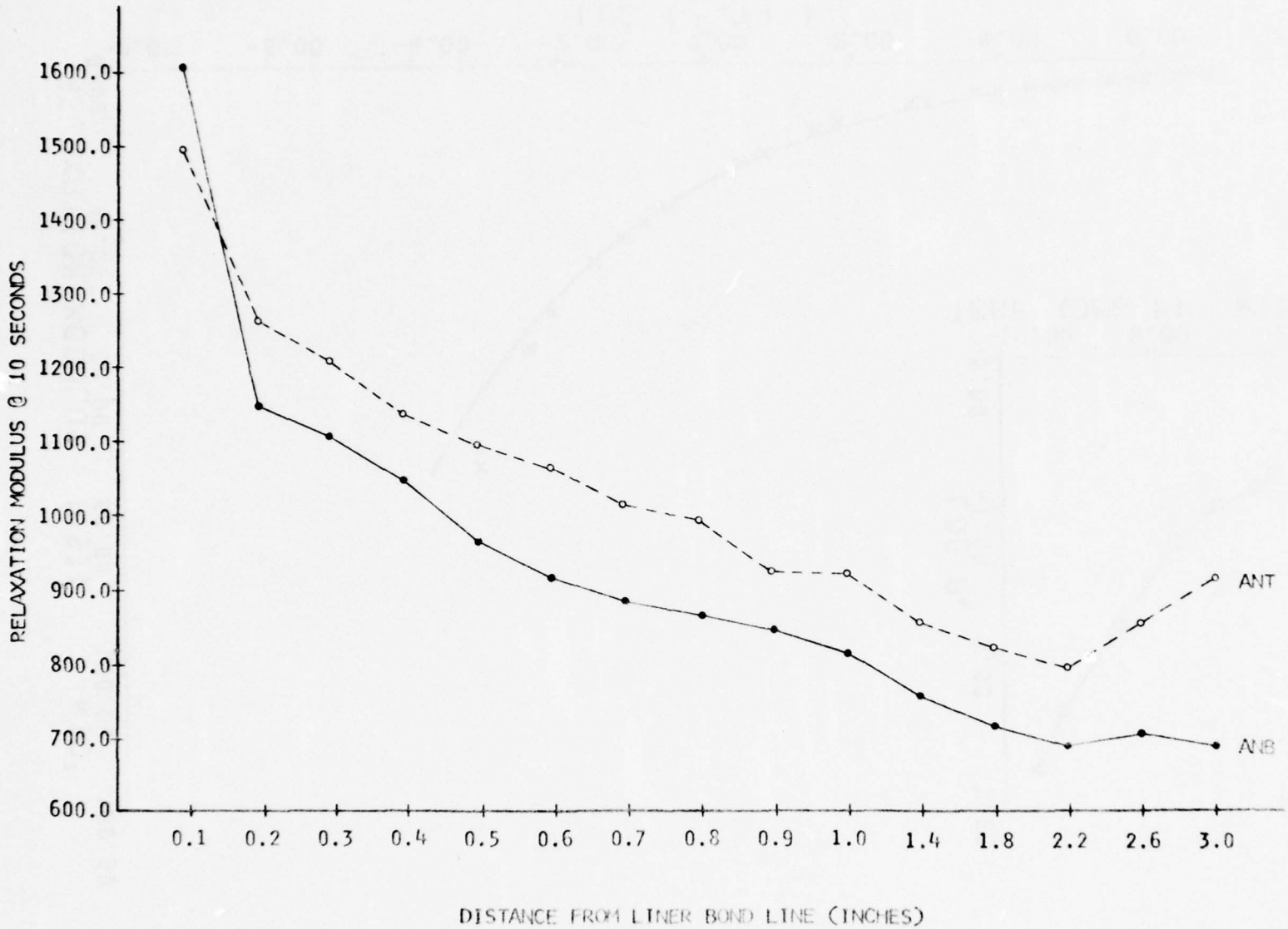

RELAXATION MODULUS @ 10 SECONDS
1600.0
1500.0
1400.0
1300.0
1200.0
1100.0
1000.0
900.0
800.0
700.0
600.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
1.4
1.8
2.2
2.6
3.0
ANT
ANB
DISTANCE FROM LINER BOND LINE (INCHES)

Figure 6-14

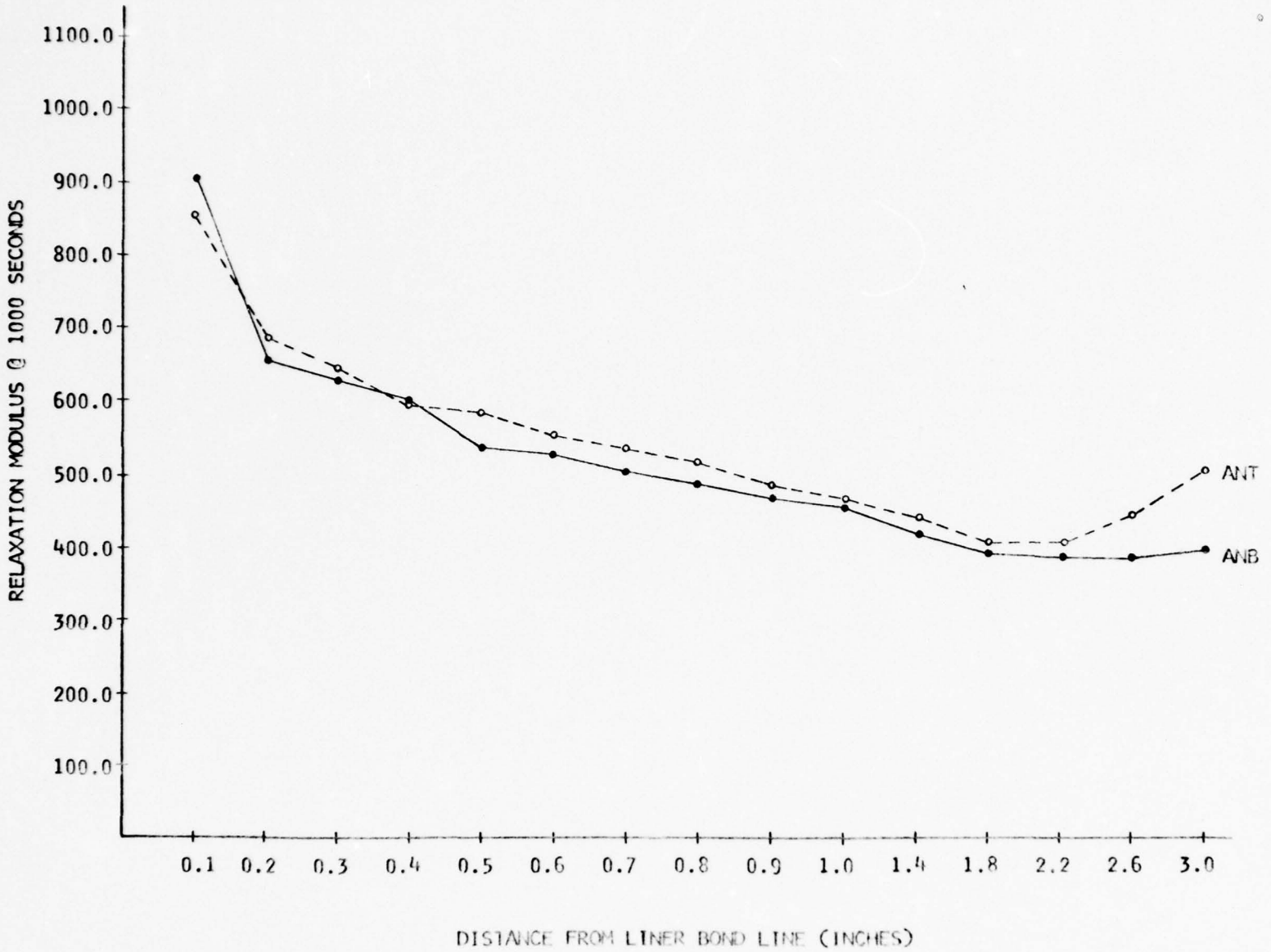

RELAXATION MODULUS @ 1000 SECONDS
1100.0
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
1.4
1.8
2.2
2.6
3.0
ANT
ANB
DISTANCE FROM LINER BOND LINE (INCHES)

Figure 6-15

SECTION VII

Thermal Coefficient of Linear Expansion

Thermal coefficient of linear expansion (TCLE) is run using an expansion probe on the DuPont 990 TMA. The specimen is a 0.200" wafer (.508cm) which is cooled to -110°C with liquid nitrogen then heated at 5°C/min. The glass point (Tg) and TCLE above glass point, (over the range -110°C to +40°C) is determined. TCLE below glass point is not considered to be of value in stress analysis.

ANA does not show a significant change in glass point, but has a significant increase in TCLE above glass point (Figure 7-1).

Data on ANB lined cartons was limited but TCLE above Tg showed a significant increase (Figure 7-5).

ANT lined cartons show a significant decrease in glass point (Figure 7-6) and a significant increase in TCLE below Tg (Figure 7-7).

All ANB shows a significant decrease in glass point (Figure 7-8) and a significant decrease in TCLE below Tg (Figure 7-9).

It is apparent that there is much variation in the data but as the data base expands there should be greater consistency.

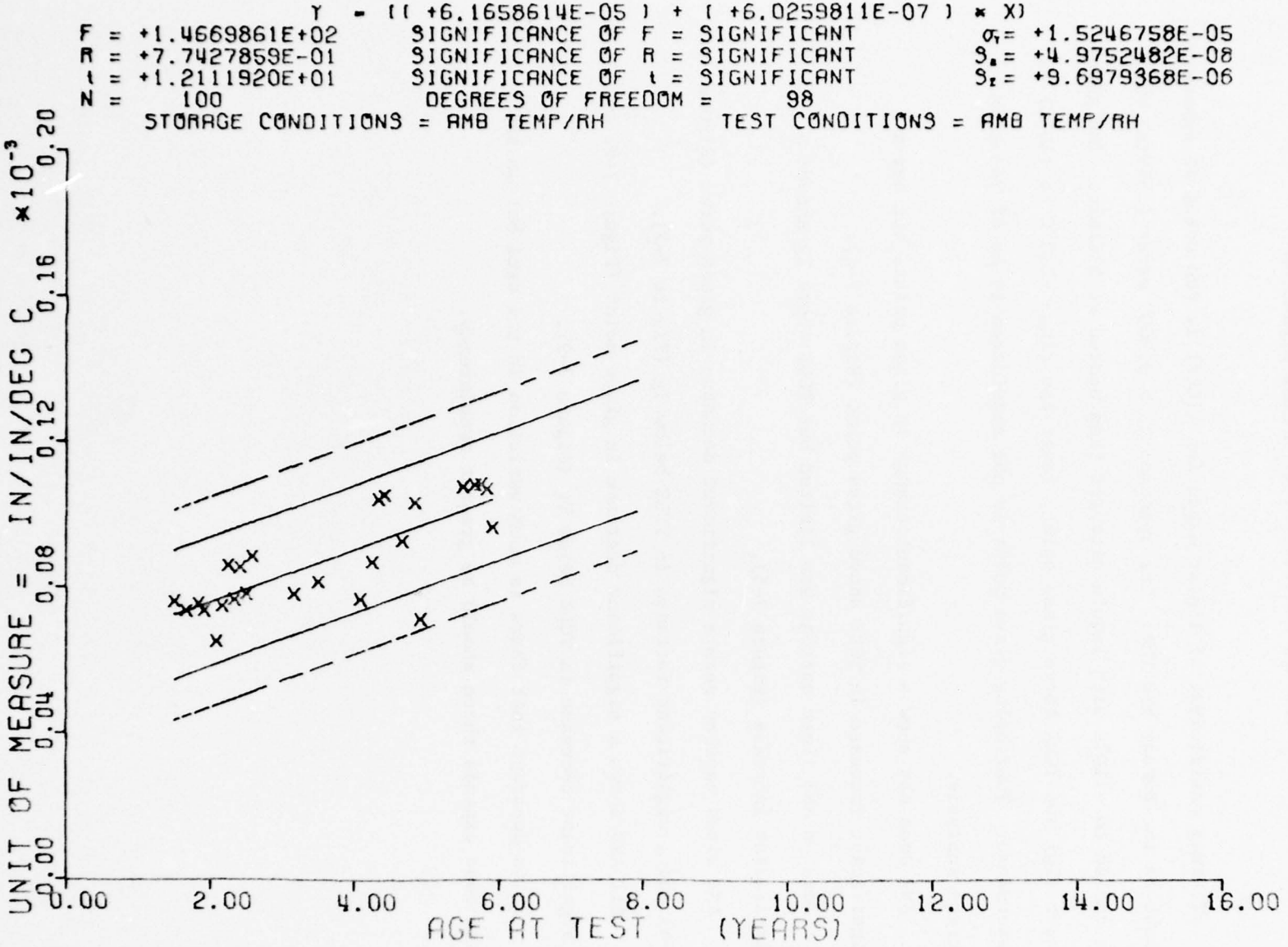

Y = (+6.1658614E-05) + (+6.0259811E-07) * X)
F = +1.4669861E+02 SIGNIFICANCE OF F = SIGNIFICANT σ = +1.5246758E-05
R = +7.7427859E-01 SIGNIFICANCE OF R = SIGNIFICANT S = +4.9752482E-08
t = +1.2111920E+01 SIGNIFICANCE OF t = SIGNIFICANT S = +9.6979368E-06
N = 100 DEGREES OF FREEDOM = 98
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = COEFF OF EXPANSION
UNIT OF MEASURE = IN/IN/DEG C *10-3
0.00
0.04
0.08
0.12
0.16
0.20
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
ANB 3066 PROPELLANT (ANA) TCLE ABOVE GLASS POINT, UNLND CARTONS

Figure 7-1

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
13.0	6	-7.9166656E+01	+1.3291601E+00	-7.8000000E+01	-8.1000000E+01	-7.6201766E+01
16.0	3	-7.8666656E+01	+3.2145502E+00	-7.5000000E+01	-8.1000000E+01	-7.6105834E+01
17.0	6	-7.6833328E+01	+1.4719601E+00	-7.5000000E+01	-7.9000000E+01	-7.6073852E+01
21.0	3	-7.5333328E+01	+5.7735026E-01	-7.5000000E+01	-7.6000000E+01	-7.5945938E+01
22.0	3	-7.7000000E+01	+0.0000000E+43	-7.7000000E+01	-7.7000000E+01	-7.5913955E+01
23.0	3	-7.6666656E+01	+1.5275252E+00	-7.5000000E+01	-7.8000000E+01	-7.5881988E+01
24.0	3	-7.2000000E+01	+0.0000000E+51	-7.2000000E+01	-7.2000000E+01	-7.5850006E+01
27.0	3	-7.7000000E+01	+1.0000000E+00	-7.6000000E+01	-7.8000000E+01	-7.5754074E+01
28.0	6	-7.1833328E+01	+2.2886019E+00	-7.0000000E+01	-7.5000000E+01	-7.5722091E+01
29.0	3	-7.9666656E+01	+2.0816659E+00	-7.8000000E+01	-8.2000000E+01	-7.5690109E+01
30.0	3	-7.3000000E+01	+2.6457513E+00	-7.1000000E+01	-7.6000000E+01	-7.5658126E+01
31.0	6	-7.5333328E+01	+1.8618986E+00	-7.2000000E+01	-7.7000000E+01	-7.5626159E+01
33.0	5	-7.4799987E+01	+3.5637059E+00	-7.0000000E+01	-7.8000000E+01	-7.5562194E+01
34.0	4	-7.6500000E+01	+3.4156502E+00	-7.2000000E+01	-8.0000000E+01	-7.5530212E+01
35.0	4	-7.6500000E+01	+2.6457513E+00	-7.4000000E+01	-8.0000000E+01	-7.5498245E+01
36.0	6	-7.7500000E+01	+2.0736441E+00	-7.4000000E+01	-7.9000000E+01	-7.5466262E+01
37.0	4	-7.6250000E+01	+5.0000000E-01	-7.6000000E+01	-7.7000000E+01	-7.5434280E+01
38.0	6	-7.2833328E+01	+5.6452259E+00	-6.2000000E+01	-7.8000000E+01	-7.5402297E+01
39.0	3	-7.9333328E+01	+1.1547005E+00	-7.8000000E+01	-8.0000000E+01	-7.5370330E+01
41.0	3	-7.8000000E+01	+1.0000000E+00	-7.7000000E+01	-7.9000000E+01	-7.5306365E+01
42.0	1	-7.4000000E+01	+0.0000000E+07	-7.4000000E+01	-7.4000000E+01	-7.5274383E+01
43.0	3	-7.6333328E+01	+1.1547005E+00	-7.5000000E+01	-7.7000000E+01	-7.5242416E+01
45.0	1	-7.6000000E+01	+0.0000000E+15	-7.6000000E+01	-7.6000000E+01	-7.5178451E+01
47.0	4	-6.9750000E+01	+5.6789083E+00	-6.2000000E+01	-7.4000000E+01	-7.5114501E+01
48.0	3	-7.6000000E+01	+1.9999999E+00	-7.4000000E+01	-7.8000000E+01	-7.5082519E+01
49.0	6	-7.1500000E+01	+5.6480084E+00	-6.6000000E+01	-8.1000000E+01	-7.5050537E+01
50.0	3	-7.8000000E+01	+2.6457513E+00	-7.5000000E+01	-8.0000000E+01	-7.5018554E+01
51.0	3	-7.4333328E+01	+2.0816659E+00	-7.2000000E+01	-7.6000000E+01	-7.4986587E+01
52.0	6	-7.7500000E+01	+5.3944415E+00	-7.1000000E+01	-8.3000000E+01	-7.4954605E+01
53.0	13	-7.3384613E+01	+4.3691811E+00	-6.5000000E+01	-7.9000000E+01	-7.4922622E+01
54.0	16	-7.1875000E+01	+4.2720018E+00	-6.5000000E+01	-7.8000000E+01	-7.4890640E+01

ANB 3066 PROPELLANT(ANB) GLASS POINT, UNLND CARTONS

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
19.0	3	+7.6333322E-05	+1.3316666E-05	+9.0999994E-05	+6.4999985E-05	+7.2505368E-05
20.0	6	+7.3666597E-05	+8.5014706E-06	+8.5999985E-05	+6.3999992E-05	+7.3710572E-05
22.0	1	+7.5666655E-05	+1.1060424E-05	+8.5999985E-05	+6.3999992E-05	+7.4915762E-05
23.0	3	+7.3666655E-05	+5.0333250E-06	+7.8999990E-05	+6.8999986E-05	+7.5518357E-05
25.0	3	+6.5333311E-05	+6.6583222E-06	+7.0999987E-05	+5.7999990E-05	+7.6723561E-05
26.0	3	+7.4999989E-05	+9.9999258E-06	+8.4999992E-05	+6.4999985E-05	+7.7326156E-05
27.0	3	+8.6333282E-05	+9.8662062E-06	+9.2999995E-05	+7.4999989E-05	+7.7928751E-05
28.0	3	+7.6666648E-05	+7.7674876E-06	+8.2999991E-05	+6.7999993E-05	+7.8531360E-05
29.0	3	+8.5666615E-05	+5.0341705E-06	+9.0999994E-05	+8.0999991E-05	+7.9133955E-05
30.0	3	+7.8333323E-05	+7.7674328E-06	+8.6999993E-05	+7.1999995E-05	+7.9736550E-05
31.0	3	+8.8666638E-05	+6.8071197E-06	+9.3999988E-05	+8.0999991E-05	+8.0339144E-05
38.0	3	+7.8333323E-05	+8.6215917E-06	+8.5999985E-05	+6.8999986E-05	+8.4557337E-05
42.0	3	+8.1733247E-05	+3.0887480E-06	+8.3899998E-05	+7.8199998E-05	+8.6967731E-05
49.0	3	+7.6766649E-05	+2.2675458E-06	+7.8499984E-05	+7.4199997E-05	+9.1185909E-05
51.0	3	+8.6965581E-05	+7.2077137E-07	+8.7599997E-05	+8.6199986E-05	+9.2391113E-05
52.0	3	+1.0429997E-04	+5.8900866E-06	+1.1099998E-04	+1.0079999E-04	+9.2993708E-05
53.0	3	+1.0539994E-04	+3.6364810E-05	+1.0939998E-04	+1.0229999E-04	+9.3596303E-05
55.0	6	+9.2849906E-05	+4.2835984E-06	+9.7999989E-05	+8.8799992E-05	+9.5404102E-05
58.0	3	+1.0343329E-04	+3.1271497E-06	+1.0629999E-04	+1.0099999E-04	+9.8609292E-05
59.0	1	+7.1299989E-05	+0.0000000E+47	+7.1299989E-05	+7.1299989E-05	+9.9211901E-05
56.0	3	+1.0773329E-04	+1.9878465E-06	+1.0989999E-04	+1.0599999E-04	+1.0143007E-04
68.0	3	+1.0829992E-04	+2.4289512E-06	+1.1099998E-04	+1.0689999E-04	+1.0263528E-04
69.0	9	+1.0845540E-04	+9.1640605E-06	+1.2219999E-04	+9.7199997E-05	+1.0323787E-04
70.0	9	+1.0721097E-04	+8.6214201E-06	+1.1809999E-04	+9.1599998E-05	+1.0384047E-04
71.0	12	+9.6558258E-05	+8.3611732E-06	+1.0599999E-04	+8.2999991E-05	+1.0444306E-04

ANB 3066 PROPELLANT(ANA) TGLE ABOVE GLASS POINT, UNLND CARTONS

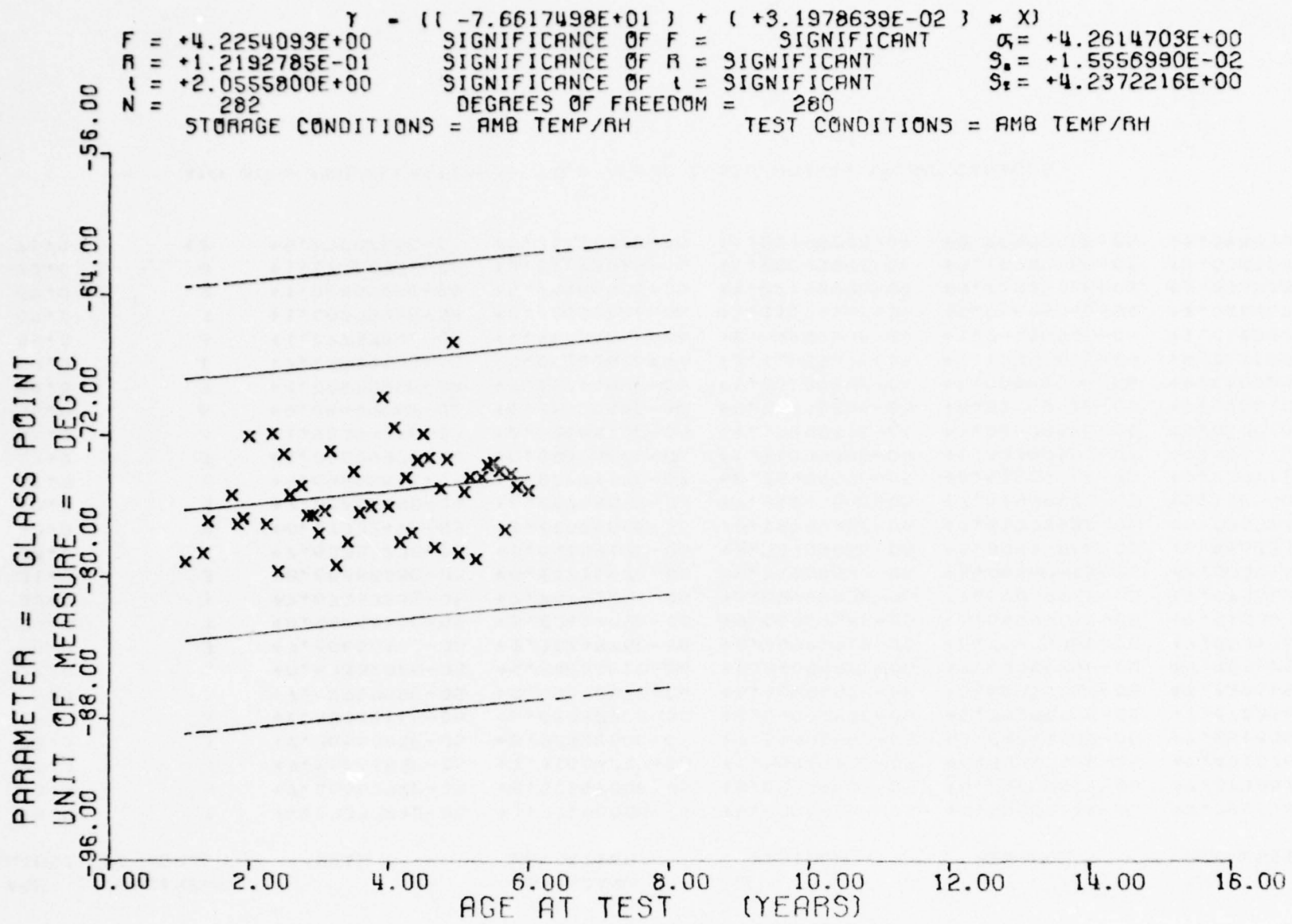

Y = ((-7.6617498E+01) + (+3.1978639E-02) * X)
F = +4.2254093E+00 SIGNIFICANCE OF F = SIGNIFICANT σ = +4.2614703E+00
R = +1.2192785E-01 SIGNIFICANCE OF R = SIGNIFICANT S_a = +1.5556990E-02
t = +2.0555800E+00 SIGNIFICANCE OF t = SIGNIFICANT S_t = +4.2372216E+00
N = 282 DEGREES OF FREEDOM = 280
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = GLASS POINT
UNIT OF MEASURE = DEG C
-56.00
-64.00
-72.00
-80.00
-88.00
-96.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
ANB 3066 PROPELLANT(ANB) GLASS POINT, UNLND CARTONS

Figure 7-2

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
13.0	6	-7.9166656E+01	+1.3291601E+00	-7.8000000E+01	-8.1000000E+01	-7.6201766E+01
16.0	3	-7.8666656E+01	+3.2145502E+00	-7.5000000E+01	-8.1000000E+01	-7.6105834E+01
17.0	6	-7.6833328E+01	+1.4719601E+00	-7.5000000E+01	-7.9000000E+01	-7.6073852E+01
21.0	3	-7.5333328E+01	+5.7735026E-01	-7.5000000E+01	-7.6000000E+01	-7.5945938E+01
22.0	3	-7.7000000E+01	+0.0000000E+43	-7.7000000E+01	-7.7000000E+01	-7.5913955E+01
23.0	3	-7.6666656E+01	+1.5275252E+00	-7.5000000E+01	-7.8000000E+01	-7.5881988E+01
24.0	3	-7.2000000E+01	+0.0000000E+51	-7.2000000E+01	-7.2000000E+01	-7.5850006E+01
27.0	3	-7.7000000E+01	+1.0000000E+00	-7.6000000E+01	-7.8000000E+01	-7.5754074E+01
28.0	6	-7.1833328E+01	+2.2286019E+00	-7.0000000E+01	-7.5000000E+01	-7.5722091E+01
29.0	3	-7.9666656E+01	+2.0816659E+00	-7.8000000E+01	-8.2000000E+01	-7.5690109E+01
30.0	3	-7.3000000E+01	+2.6457513E+00	-7.1000000E+01	-7.6000000E+01	-7.5658126E+01
31.0	6	-7.5333328E+01	+1.8618986E+00	-7.2000000E+01	-7.7000000E+01	-7.5626159E+01
33.0	5	-7.4799987E+01	+3.5637059E+00	-7.0000000E+01	-7.8000000E+01	-7.5562194E+01
34.0	4	-7.6500000E+01	+3.4156502E+00	-7.2000000E+01	-8.0000000E+01	-7.5530212E+01
35.0	4	-7.6500000E+01	+2.6457513E+00	-7.4000000E+01	-8.0000000E+01	-7.5498245E+01
36.0	6	-7.7500000E+01	+2.0736441E+00	-7.4000000E+01	-7.9000000E+01	-7.5466262E+01
37.0	4	-7.6250000E+01	+5.0000000E-01	-7.6000000E+01	-7.7000000E+01	-7.5434280E+01
38.0	6	-7.2833328E+01	+5.6452259E+00	-6.2000000E+01	-7.8000000E+01	-7.5402297E+01
39.0	3	-7.9333328E+01	+1.1547005E+00	-7.8000000E+01	-8.0000000E+01	-7.5370330E+01
41.0	3	-7.8000000E+01	+1.0000000E+00	-7.7000000E+01	-7.9000000E+01	-7.5306365E+01
42.0	1	-7.4000000E+01	+0.0000000E+07	-7.4000000E+01	-7.4000000E+01	-7.5274383E+01
43.0	3	-7.6333328E+01	+1.1547005E+00	-7.5000000E+01	-7.7000000E+01	-7.5242416E+01
45.0	1	-7.6000000E+01	+0.0000000E+15	-7.6000000E+01	-7.6000000E+01	-7.5178451E+01
47.0	4	-6.9750000E+01	+5.6789083E+00	-6.2000000E+01	-7.4000000E+01	-7.5114501E+01
48.0	3	-7.6000000E+01	+1.9999999E+00	-7.4000000E+01	-7.8000000E+01	-7.5082519E+01
49.0	6	-7.1500000E+01	+5.6480084E+00	-6.6000000E+01	-8.1000000E+01	-7.5050537E+01
50.0	3	-7.8000000E+01	+2.6457513E+00	-7.5000000E+01	-8.0000000E+01	-7.5018554E+01
51.0	3	-7.4333328E+01	+2.0816659E+00	-7.2000000E+01	-7.6000000E+01	-7.4986587E+01
52.0	6	-7.7500000E+01	+5.3944415E+00	-7.1000000E+01	-8.3000000E+01	-7.4954605E+01
53.0	13	-7.3384613E+01	+4.3691811E+00	-6.5000000E+01	-7.9000000E+01	-7.4922622E+01
54.0	16	-7.1875000E+01	+4.2720018E+00	-6.5000000E+01	-7.8000000E+01	-7.4890640E+01

ANB 3066 PROPELLANT(ANB) GLASS POINT, UNLND CARTONS

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
55.0	13	-7.3230758E+01	+4.4376015E+00	-6.7000000E+01	-8.1000000E+01	-7.4858673E+01
56.0	6	-7.8333328E+01	+1.7511900E+00	-7.7000000E+01	-8.1000000E+01	-7.4826690E+01
57.0	6	-7.5000000E+01	+1.6733200E+00	-7.3000000E+01	-7.7000000E+01	-7.4794708E+01
58.0	12	-7.3333328E+01	+4.1633319E+00	-6.2000000E+01	-7.8000000E+01	-7.4762725E+01
59.0	3	-6.6666656E+01	+5.0332229E+00	-6.2000000E+01	-7.2000000E+01	-7.4730758E+01
60.0	9	-7.8666656E+01	+1.9999999E+00	-7.5000000E+01	-8.1000000E+01	-7.4698776E+01
61.0	11	-7.5181808E+01	+4.8952667E+00	-6.9000000E+01	-8.4000000E+01	-7.4666793E+01
62.0	9	-7.4333328E+01	+2.8722813E+00	-6.8000000E+01	-7.9000000E+01	-7.4634811E+01
63.0	9	-7.5000000E+01	+2.1794494E+00	-7.6000000E+01	-8.2000000E+01	-7.4602844E+01
64.0	3	-7.4333328E+01	+1.5275252E+00	-7.3000000E+01	-7.6000000E+01	-7.4570861E+01
65.0	3	-7.3666656E+01	+2.0816659E+00	-7.2000000E+01	-7.6000000E+01	-7.4538879E+01
66.0	4	-7.3500000E+01	+3.4156502E+00	-6.9000000E+01	-7.7000000E+01	-7.4506896E+01
67.0	1	-7.4000000E+01	+0.0000000E+99	-7.4000000E+01	-7.4000000E+01	-7.4474929E+01
68.0	3	-7.7333328E+01	+1.1547005E+00	-7.6000000E+01	-7.8000000E+01	-7.4442947E+01
69.0	18	-7.4111099E+01	+3.3235149E+00	-6.8000000E+01	-8.0000000E+01	-7.4410964E+01
70.0	12	-7.4916656E+01	+5.5670839E+00	-5.8000000E+01	-7.8000000E+01	-7.4378982E+01
72.0	18	-7.5111099E+01	+6.1058206E+00	-5.6000000E+01	-8.1000000E+01	-7.4315032E+01

ANB 3066 PROPELLANT(ANB) GLASS POINT, UNLND CARTONS

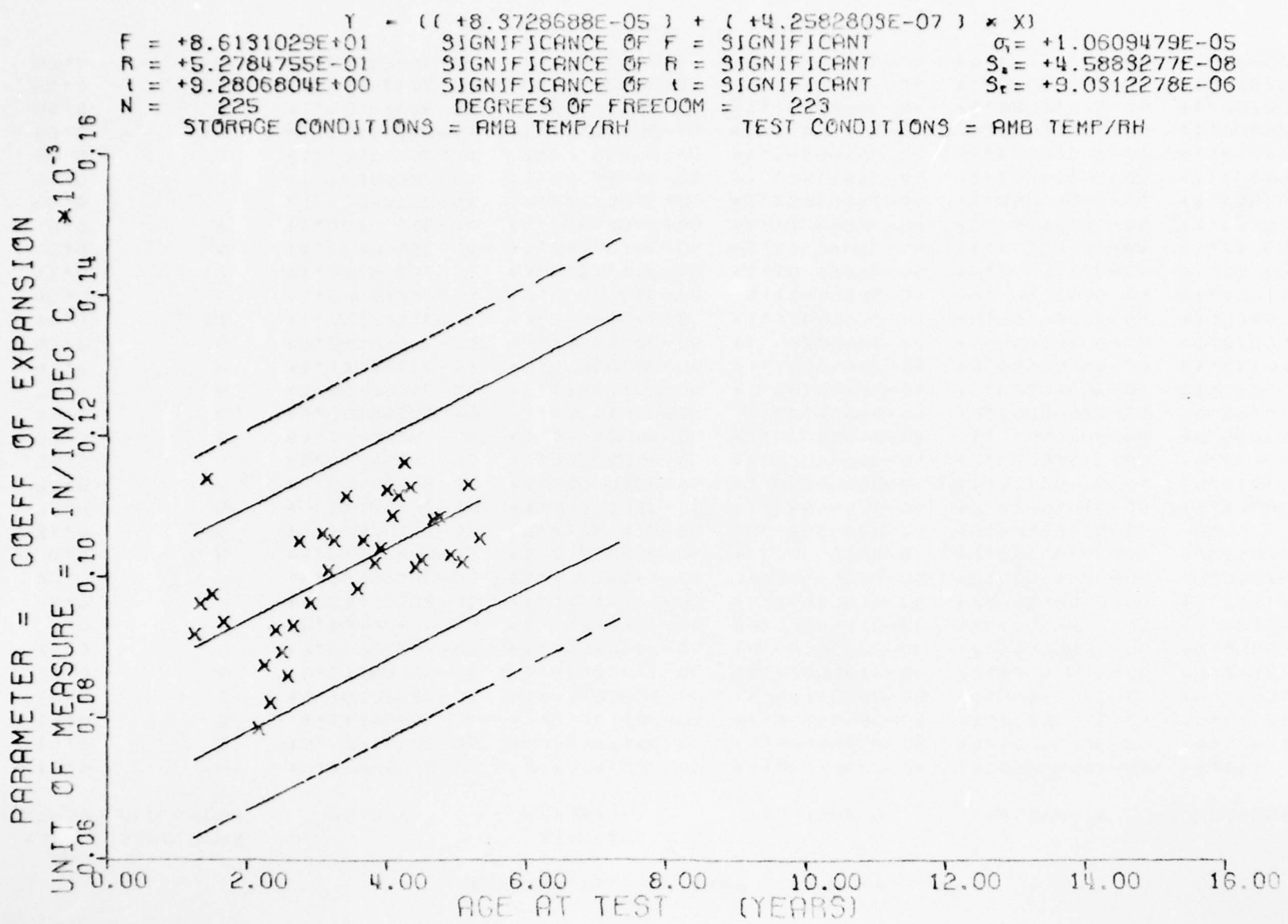

Y = ((+8.3728688E-05) + (+4.2582803E-07) * X)
F = +8.6131029E+01 SIGNIFICANCE OF F = SIGNIFICANT σ1 = +1.0609479E-05
R = +5.2784755E-01 SIGNIFICANCE OF R = SIGNIFICANT Sa = +4.5883277E-08
t = +9.2806804E+00 SIGNIFICANCE OF t = SIGNIFICANT Sr = +9.0312278E-06
N = 225 DEGREES OF FREEDOM = 223
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = COEFF OF EXPANSION
UNIT OF MEASURE = IN/IN/DEG C *10-3
0.06
0.08
0.10
0.12
0.14
0.16
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
ANB 3066 PROPELLANT(ANT) TCLE ABOVE GLASS POINT, UNLND CARTONS

Figure 7-3

****** LINEAR REGRESSION ANALYSIS ******

***** ANALYSIS OF TIME SERIES *****

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
15.0	9	+9.1588826E-05	+8.6174133E-06	+1.0569998E-04	+8.0999991E-05	+9.0116096E-05
16.0	3	+9.6299918E-05	+4.0660779E-06	+9.9399985E-05	+9.1699999E-05	+9.0541929E-05
17.0	3	+1.1409996E-04	+1.7905785E-06	+1.1549999E-04	+1.1299999E-04	+9.0967761E-05
18.0	3	+9.7633252E-05	+1.4219385E-06	+9.8499993E-05	+9.5999988E-05	+9.1393580E-05
20.0	6	+9.3766604E-05	+1.8830867E-06	+9.6299991E-05	+9.1399997E-05	+9.2245245E-05
26.0	6	+7.8599929E-05	+4.2994216E-06	+8.6899992E-05	+7.4199989E-05	+9.4800212E-05
27.0	9	+8.7533262E-05	+2.6093874E-06	+9.1399997E-05	+8.4199986E-05	+9.5226045E-05
28.0	3	+8.2299957E-05	+4.7154872E-06	+8.7699998E-05	+7.8999990E-05	+9.5651863E-05
29.0	3	+9.2599919E-05	+1.4787416E-06	+9.3499998E-05	+9.0899993E-05	+9.6077696E-05
30.0	6	+8.9449924E-05	+1.0527747E-05	+1.0009999E-04	+7.5899995E-05	+9.6503528E-05
31.0	6	+8.6033251E-05	+2.7629441E-06	+8.9899986E-05	+8.2299986E-05	+9.6929346E-05
32.0	6	+9.3166629E-05	+1.2791331E-05	+1.0549998E-04	+7.7299991E-05	+9.7355179E-05
33.0	3	+1.0516664E-04	+1.2505075E-06	+1.0639999E-04	+1.0389999E-04	+9.7781012E-05
35.0	6	+9.6399919E-05	+1.5786459E-05	+1.1359999E-04	+7.9099991E-05	+9.8632663E-05
37.0	6	+1.0623324E-04	+1.2294309E-06	+1.0809999E-04	+1.0459999E-04	+9.9484313E-05
38.0	6	+1.0099995E-04	+3.4346154E-06	+1.0539998E-04	+9.7099997E-05	+9.9910146E-05
39.0	6	+1.0529994E-04	+2.5226376E-06	+1.0819999E-04	+1.0209999E-04	+1.0033597E-04
41.0	9	+1.1162211E-04	+6.4895022E-06	+1.1859998E-04	+9.6699994E-05	+1.0118763E-04
43.0	6	+9.8449949E-05	+2.7158586E-06	+1.0229999E-04	+9.5599995E-05	+1.0203928E-04
44.0	12	+1.0537491E-04	+7.2926654E-06	+1.1869998E-04	+9.8999997E-05	+1.0246511E-04
46.0	6	+1.0208322E-04	+7.5238781E-06	+1.1049999E-04	+9.2999995E-05	+1.0331676E-04
47.0	12	+1.0419986E-04	+5.4777777E-06	+1.1029999E-04	+9.2899994E-05	+1.0374259E-04
48.0	6	+1.1249995E-04	+5.3865976E-06	+1.1799999E-04	+1.0619999E-04	+1.0416842E-04
49.0	9	+1.0879991E-04	+4.7381994E-06	+1.1739999E-04	+1.0309999E-04	+1.0459424E-04
50.0	9	+1.1168877E-04	+2.2042982E-06	+1.1549999E-04	+1.0819999E-04	+1.0502008E-04
51.0	3	+1.1679995E-04	+5.3854444E-06	+1.2259998E-04	+1.1299998E-04	+1.0544591E-04
52.0	3	+1.1289995E-04	+2.1395029E-06	+1.1459999E-04	+1.1049999E-04	+1.0587173E-04
53.0	15	+1.0152655E-04	+1.0195888E-05	+1.1379999E-04	+8.6899992E-05	+1.0629756E-04
54.0	9	+1.0257767E-04	+8.6287359E-06	+1.1609999E-04	+9.3899987E-05	+1.0672339E-04
56.0	12	+1.0829158E-04	+3.0766848E-06	+1.1289998E-04	+1.0249999E-04	+1.0757504E-04
57.0	6	+1.0868324E-04	+7.7215675E-06	+1.1799999E-04	+9.7299998E-05	+1.0800098E-04

AND 306(PROPELLANT(ANT) TCLF ABOVE GLASS POINT, UNLND CAPTONS

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
59.0	6	+1.0331657E-04	+4.1770335E-06	+1.0749998E-04	+9.6399991E-05	+1.0885253E-04
61.0	3	+1.0226658E-04	+6.9538058E-07	+1.0279999E-04	+1.0149998E-04	+1.0970419E-04
62.0	3	+1.1726659E-04	+3.0174066E-06	+1.1699999E-04	+1.1099999E-04	+1.1013001E-04
64.0	6	+1.0563324E-04	+2.0919961E-06	+1.0749998E-04	+1.0249999E-04	+1.1098168E-04

ANB 3066 PROPELLANT(ANT) TCLE ABOVE GLASS POINT, UNLND CARTONS

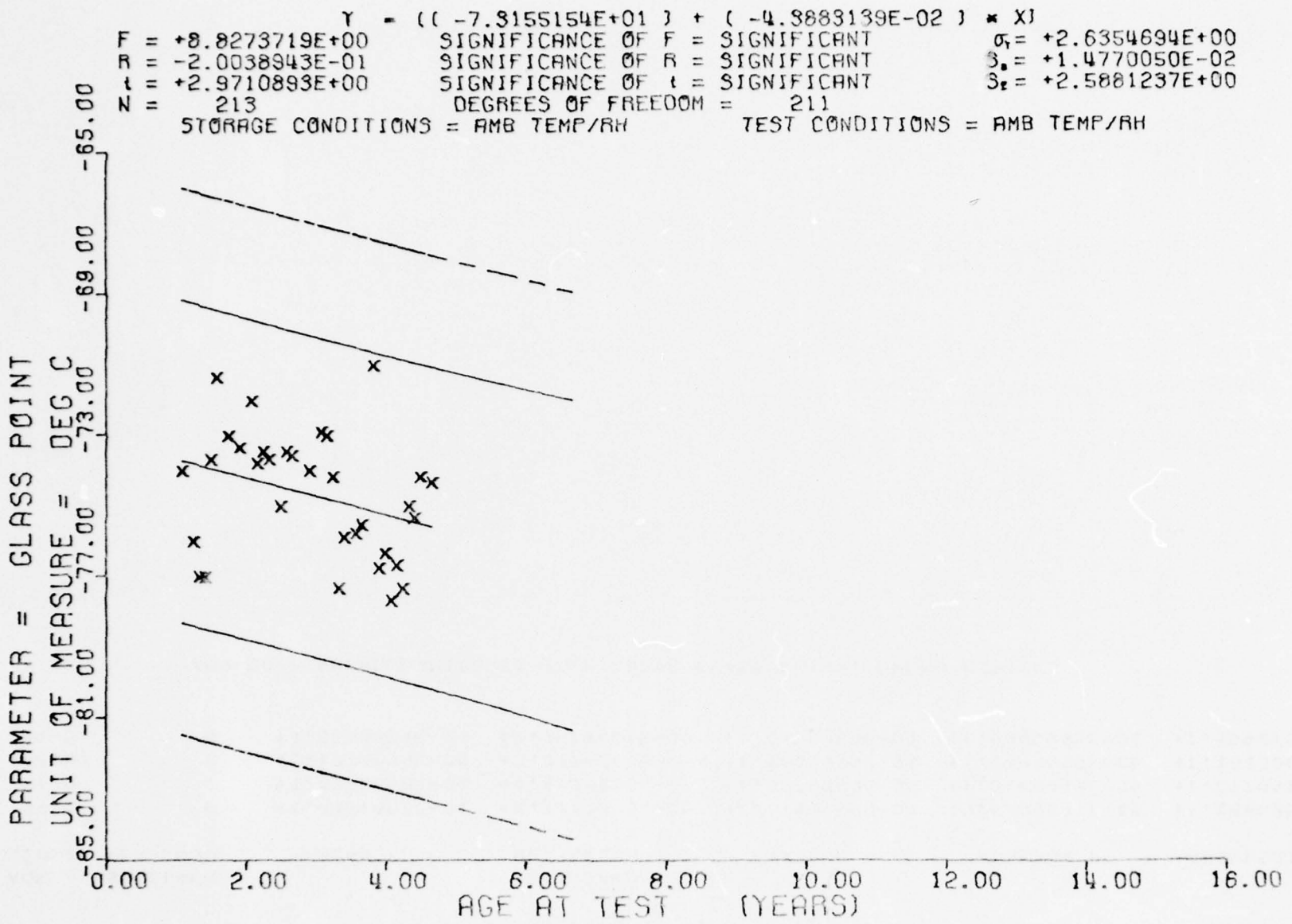

Y = ((-7.8155154E+01) + (-4.3883139E-02) * X)
F = +8.8273719E+00 SIGNIFICANCE OF F = SIGNIFICANT σr = +2.6354694E+00
R = -2.0038943E-01 SIGNIFICANCE OF R = SIGNIFICANT Sb = +1.4770050E-02
t = +2.9710893E+00 SIGNIFICANCE OF t = SIGNIFICANT Se = +2.5881237E+00
N = 213 DEGREES OF FREEDOM = 211
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = GLASS POINT
UNIT OF MEASURE = DEG C
-65.00
-69.00
-73.00
-77.00
-81.00
-85.00
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
ANB 3066 PROPELLANT (ANT) GLASS POINT, UNLND CARTONS

Figure 7-4

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
13.0	3	-7.4000000E+01	+1.0000000E+00	-7.3000000E+01	-7.5000000E+01	-7.3725631E+01
15.0	9	-7.6000000E+01	+4.9244289E+00	-6.7000000E+01	-8.2000000E+01	-7.3813400E+01
16.0	3	-7.7000000E+01	+1.0000000E+00	-7.6000000E+01	-7.8000000E+01	-7.3857284E+01
17.0	3	-7.7000000E+01	+1.0000000E+00	-7.6000000E+01	-7.8000000E+01	-7.3901153E+01
18.0	3	-7.3666656E+01	+1.5275252E+00	-7.2000000E+01	-7.5000000E+01	-7.3945037E+01
19.0	3	-7.1333328E+01	+5.7735026E-01	-7.1000000E+01	-7.2000000E+01	-7.3988922E+01
21.0	3	-7.3000000E+01	+1.7320508E+00	-7.1000000E+01	-7.4000000E+01	-7.4076690E+01
23.0	3	-7.3333328E+01	+5.7735026E-01	-7.3000000E+01	-7.4000000E+01	-7.4164459E+01
25.0	3	-7.2000000E+01	+1.0000000E+00	-7.1000000E+01	-7.3000000E+01	-7.4252227E+01
26.0	9	-7.3777770E+01	+2.1081851E+00	-7.1000000E+01	-7.7000000E+01	-7.4296112E+01
27.0	9	-7.3444442E+01	+1.3333333E+00	-7.2000000E+01	-7.6000000E+01	-7.4339996E+01
28.0	6	-7.3666656E+01	+2.2509257E+00	-7.0000000E+01	-7.6000000E+01	-7.4383880E+01
30.0	6	-7.5000000E+01	+1.2649110E+00	-7.4000000E+01	-7.7000000E+01	-7.4471633E+01
31.0	9	-7.3444442E+01	+1.4240006E+00	-7.0000000E+01	-7.5000000E+01	-7.4515518E+01
32.0	9	-7.3555541E+01	+2.1278575E+00	-7.0000000E+01	-7.6000000E+01	-7.4559402E+01
35.0	6	-7.4000000E+01	+1.0954451E+00	-7.2000000E+01	-7.5000000E+01	-7.4691055E+01
37.0	9	-7.2888885E+01	+2.2607766E+00	-6.9000000E+01	-7.5000000E+01	-7.4778823E+01
38.0	3	-7.3000000E+01	+1.0000000E+00	-7.2000000E+01	-7.4000000E+01	-7.4822708E+01
39.0	6	-7.4166656E+01	+3.1251666E+00	-7.1000000E+01	-7.7000000E+01	-7.4866592E+01
40.0	3	-7.7333328E+01	+1.5275252E+00	-7.6000000E+01	-7.9000000E+01	-7.4910476E+01
41.0	9	-7.5888885E+01	+2.5712081E+00	-7.1000000E+01	-7.9000000E+01	-7.4954360E+01
43.0	9	-7.5777770E+01	+1.9860625E+00	-7.3000000E+01	-7.9000000E+01	-7.5042114E+01
44.0	15	-7.5533325E+01	+2.6149751E+00	-7.1000000E+01	-7.9000000E+01	-7.5085998E+01
46.0	6	-7.1000000E+01	+2.0976176E+00	-6.9000000E+01	-7.5000000E+01	-7.5173767E+01
47.0	12	-7.6750000E+01	+2.8643577E+00	-6.9000000E+01	-7.9000000E+01	-7.5217651E+01
48.0	6	-7.6333328E+01	+1.0327955E+00	-7.5000000E+01	-7.8000000E+01	-7.5261535E+01
49.0	9	-7.7666656E+01	+2.5495097E+00	-7.3000000E+01	-8.0000000E+01	-7.5305419E+01
50.0	9	-7.6666656E+01	+1.2247448E+00	-7.5000000E+01	-7.9000000E+01	-7.5349304E+01
51.0	3	-7.7333328E+01	+5.7735026E-01	-7.7000000E+01	-7.8000000E+01	-7.5393188E+01
52.0	3	-7.5000000E+01	+1.0000000E+00	-7.4000000E+01	-7.6000000E+01	-7.5437072E+01
53.0	9	-7.5333328E+01	+2.2360679E+00	-7.3000000E+01	-7.9000000E+01	-7.5480957E+01

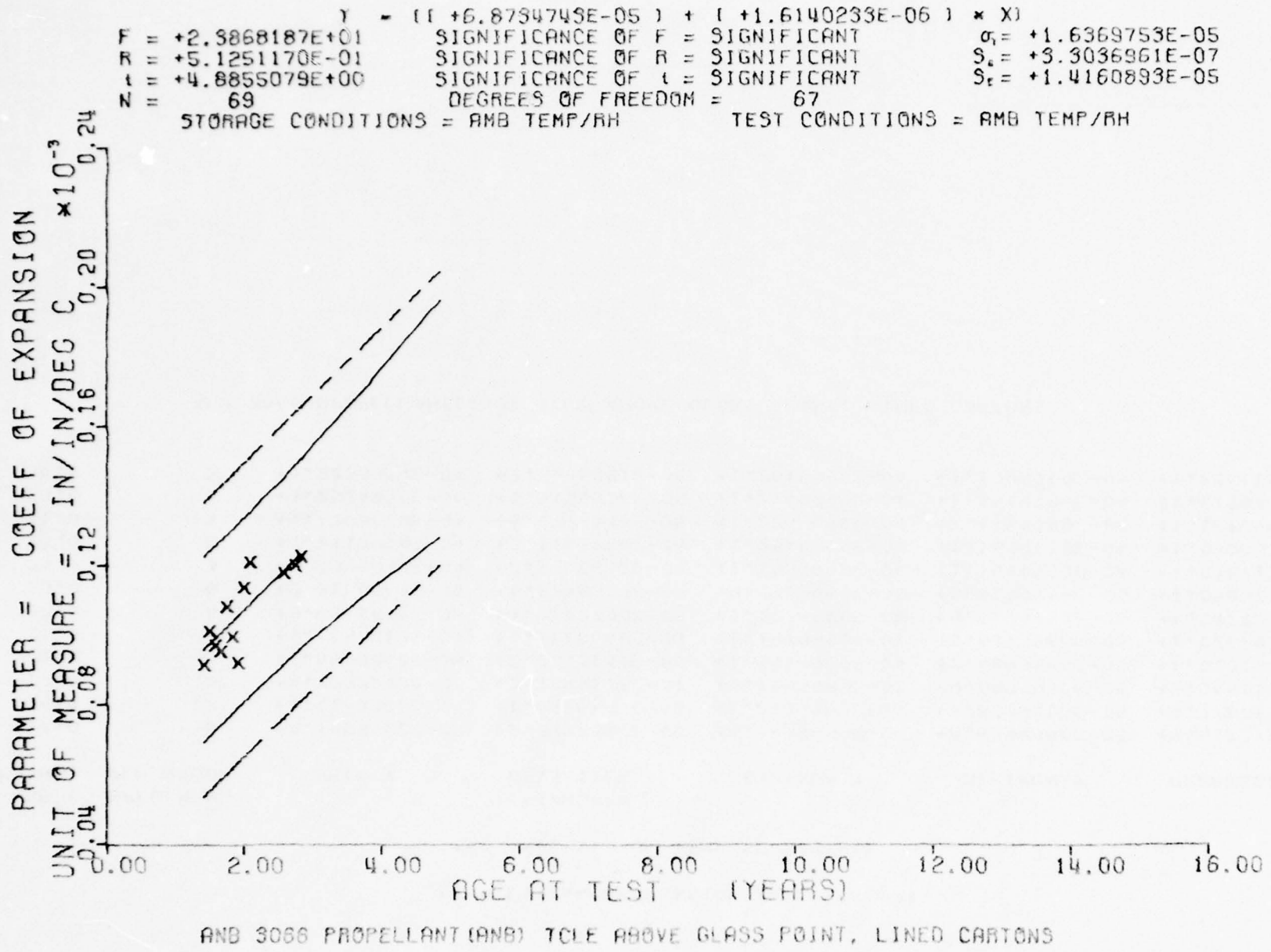
ANB 306E PROPELLANT(ANT) GLASS POINT, UNLND CARTONS

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
54.0	6	-7.4166656E+01	+2.7668739E+00	-7.2000000E+01	-7.9000000E+01	-7.5524841E+01
56.0	9	-7.4333328E+01	+1.4142135E+00	-7.2000000E+01	-7.6000000E+01	-7.5612609E+01

AN8 3066 PROPELLANT(ANT) CLASS POINT, UNLND CARTONS



AND 3066 PROPELLANT(ANB) TCLE ABOVE GLASS POINT, LINED CARTONS

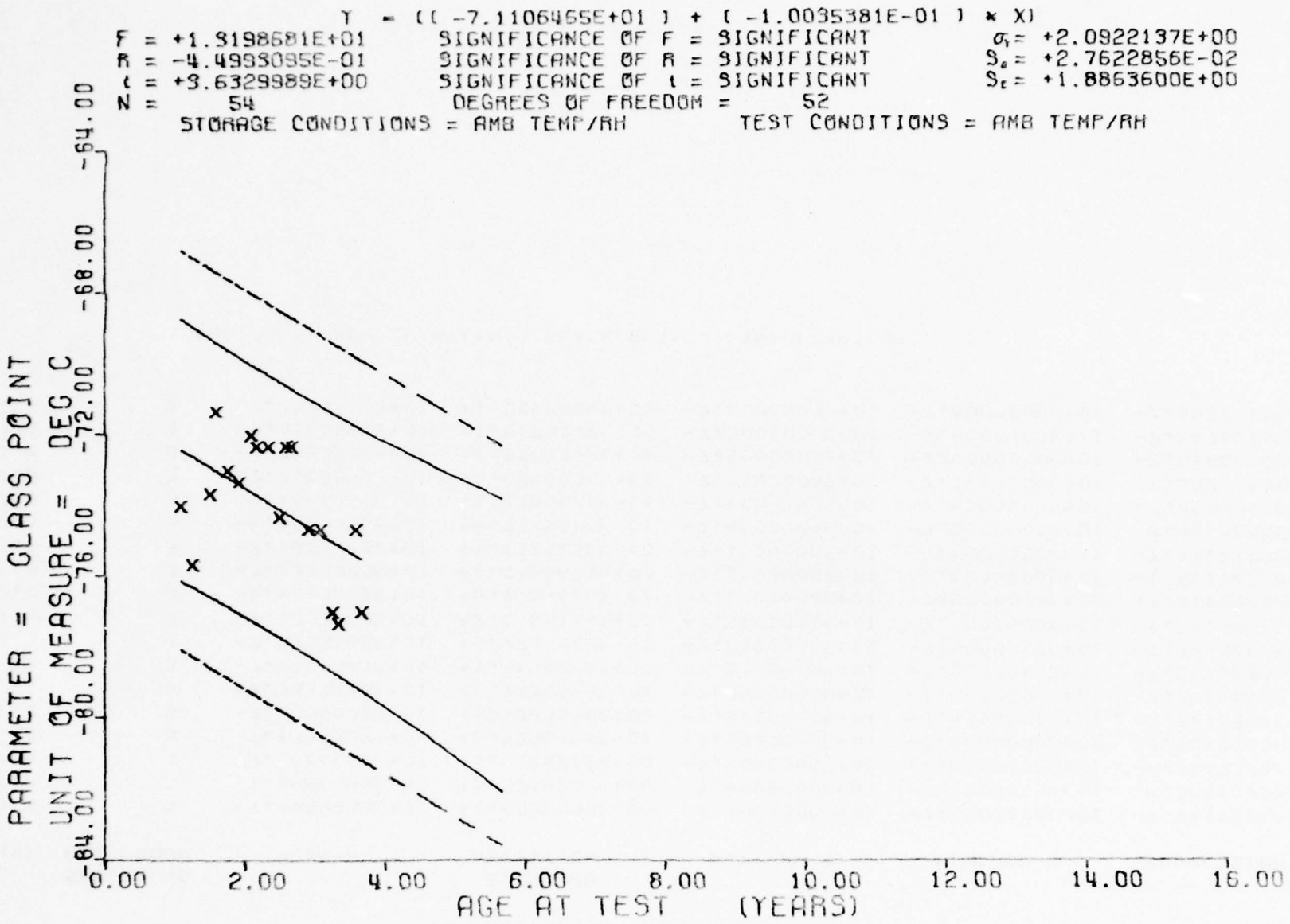
Figure 7-5

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
17.0	6	+9.1699912E-05	+2.3152340E-05	+1.1439999E-04	+6.6399996E-05	+9.6173127E-05
18.0	12	+1.0143325E-04	+1.6796297E-05	+1.2139999E-04	+7.8999990E-05	+9.7787153E-05
19.0	3	+9.7333293E-05	+3.1989535E-07	+9.7599986E-05	+9.6999996E-05	+9.9401178E-05
20.0	6	+9.5599942E-05	+2.2333148E-05	+1.1959999E-04	+7.4899988E-05	+1.0101520E-04
21.0	9	+1.0852213E-04	+1.1510048E-05	+1.1979999E-04	+8.6399988E-05	+1.0262923E-04
22.0	6	+9.9816548E-05	+1.3013790E-05	+1.1239999E-04	+8.5199993E-05	+1.0424325E-04
23.0	6	+9.2266549E-05	+4.0345313E-06	+9.6999996E-05	+8.5299994E-05	+1.0585726E-04
24.0	3	+1.1393325E-04	+2.9868962E-06	+1.1589999E-04	+1.1049999E-04	+1.0747129E-04
25.0	6	+1.2119994E-04	+3.1863298E-06	+1.2549999E-04	+1.1699998E-04	+1.0908531E-04
31.0	3	+1.1796658E-04	+4.0798634E-06	+1.2249998E-04	+1.1459999E-04	+1.1876945E-04
33.0	6	+1.2024995E-04	+1.3155534E-06	+1.2149999E-04	+1.1819999E-04	+1.2199750E-04
34.0	3	+1.2283329E-04	+3.5656881E-06	+1.2619998E-04	+1.1909999E-04	+1.2361153E-04

ANB 3066 PROPELLANT(ANB) ICLE ABOVE GLASS POINT, LINED CARTONS



ANB 3066 PROPELLANT(ANT) GLASS POINT, LINED CARTONS

Figure 7-6

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
13.0	3	-7.4000000E+01	+1.0000000E+00	-7.3000000E+01	-7.5000000E+01	-7.2411056E+01
15.0	3	-7.5666656E+01	+1.5275252E+00	-7.4000000E+01	-7.7000000E+01	-7.2611770E+01
18.0	3	-7.3666656E+01	+1.5275252E+00	-7.2000000E+01	-7.5000000E+01	-7.2912826E+01
19.0	3	-7.1333328E+01	+5.7735026E-01	-7.1000000E+01	-7.2000000E+01	-7.3013183E+01
21.0	3	-7.3000000E+01	+1.7320508E+00	-7.1000000E+01	-7.4000000E+01	-7.3213882E+01
23.0	3	-7.3333328E+01	+5.7735026E-01	-7.3000000E+01	-7.4000000E+01	-7.3414596E+01
25.0	3	-7.2000000E+01	+1.0000000E+00	-7.1000000E+01	-7.3000000E+01	-7.3615295E+01
26.0	3	-7.2333328E+01	+5.7735026E-01	-7.2000000E+01	-7.3000000E+01	-7.3715652E+01
28.0	3	-7.2333328E+01	+2.5166114E+00	-7.0000000E+01	-7.5000000E+01	-7.3916366E+01
30.0	3	-7.4333328E+01	+5.7735026E-01	-7.4000000E+01	-7.5000000E+01	-7.4117065E+01
31.0	3	-7.2333328E+01	+2.0816659E+00	-7.0000000E+01	-7.4000000E+01	-7.4217422E+01
32.0	3	-7.2333328E+01	+1.5275252E+00	-7.1000000E+01	-7.4000000E+01	-7.4317779E+01
35.0	3	-7.4666656E+01	+5.7735026E-01	-7.4000000E+01	-7.5000000E+01	-7.4618835E+01
37.0	3	-7.4666656E+01	+5.7735026E-01	-7.4000000E+01	-7.5000000E+01	-7.4819549E+01
39.0	3	-7.7000000E+01	+0.0000000E+01	-7.7000000E+01	-7.7000000E+01	-7.5020263E+01
40.0	3	-7.7333328E+01	+1.5275252E+00	-7.6000000E+01	-7.9000000E+01	-7.5120605E+01
43.0	3	-7.4666656E+01	+1.5275252E+00	-7.3000000E+01	-7.6000000E+01	-7.5421676E+01
44.0	3	-7.7000000E+01	+1.0000000E+00	-7.6000000E+01	-7.8000000E+01	-7.5522018E+01

ANB 3066 PROPELLANT(ANT) GLASS POINT, LINED CARTONS

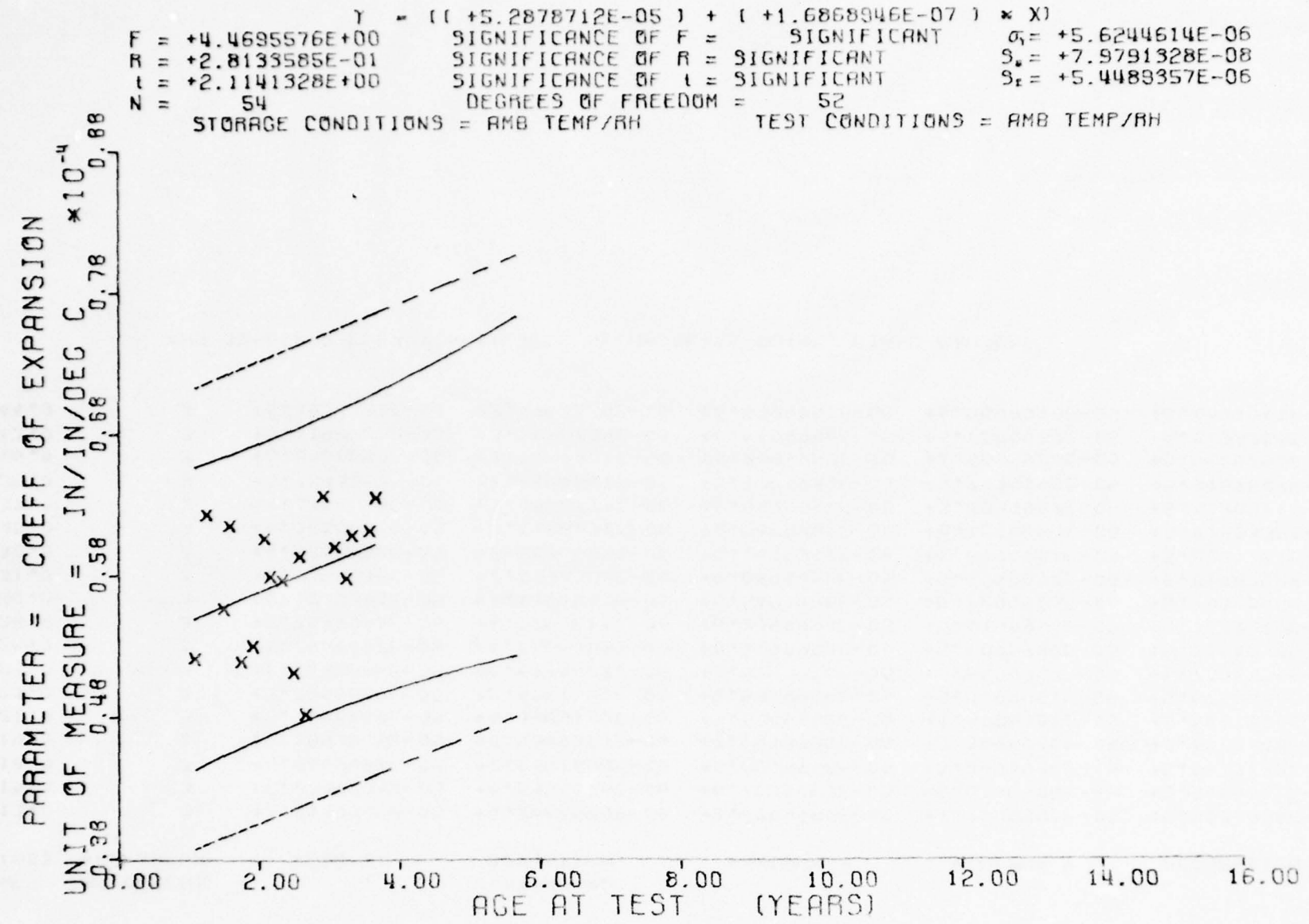

Y = ((+5.2878712E-05) + (+1.6868946E-07) * X)
F = +4.4695576E+00 SIGNIFICANCE OF F = SIGNIFICANT σ1 = +5.6244614E-06
R = +2.8133585E-01 SIGNIFICANCE OF R = SIGNIFICANT Se = +7.9791328E-08
t = +2.1141328E+00 SIGNIFICANCE OF t = SIGNIFICANT St = +5.4489357E-06
N = 54 DEGREES OF FREEDOM = 52
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = COEFF OF EXPANSION
UNIT OF MEASURE = IN/IN/DEG C *10-4
0.38
0.48
0.58
0.68
0.78
0.88
0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
16.00
AGE AT TEST (YEARS)
ANB 3066 PROPELLANT (ANT) TCLE BELOW GLASS POINT, LINED CARTONS

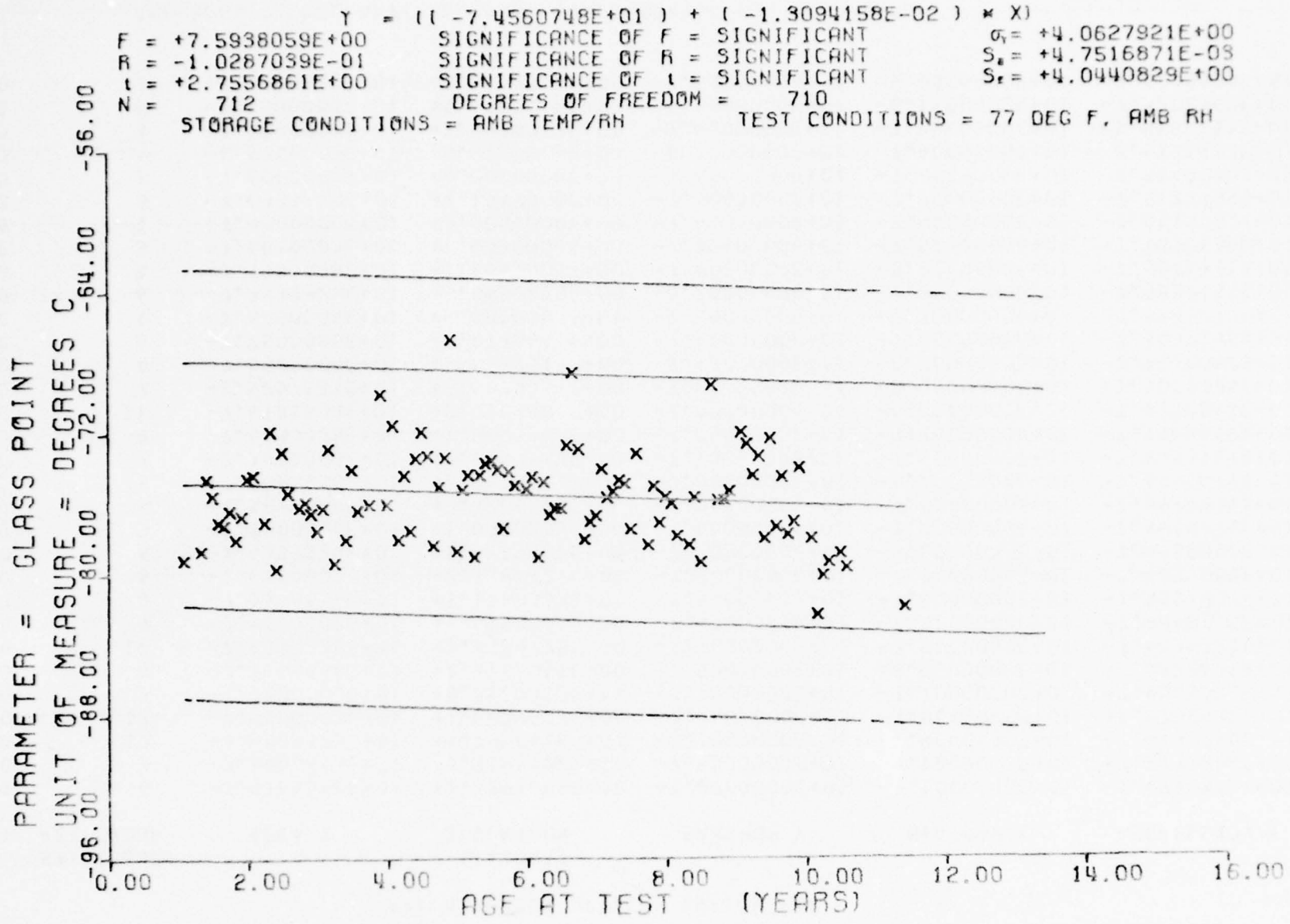
Figure 7-7

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
13.0	3	+5.2199990E-05	+4.2460989E-06	+5.4799995E-05	+4.7299996E-05	+5.5071664E-05
15.0	3	+6.2399994E-05	+4.9150378E-06	+6.7999993E-05	+5.8799996E-05	+5.5409051E-05
18.0	3	+5.5699987E-05	+2.8581690E-06	+5.8999998E-05	+5.3999999E-05	+5.5915123E-05
19.0	3	+6.1599988E-05	+8.9369307E-06	+7.1299989E-05	+5.3699986E-05	+5.6083808E-05
21.0	3	+5.1966650E-05	+4.1789182E-06	+5.6399992E-05	+4.8099997E-05	+5.6421180E-05
23.0	3	+5.3066658E-05	+2.4581592E-06	+5.5399999E-05	+5.0499991E-05	+5.6758566E-05
25.0	3	+6.0699995E-05	+6.5774687E-06	+6.8399995E-05	+5.6499993E-05	+5.7095938E-05
26.0	3	+5.7966652E-05	+4.0065358E-06	+6.2099992E-05	+5.4099989E-05	+5.7264638E-05
28.0	3	+5.7699988E-05	+4.2296618E-06	+6.2399994E-05	+5.4199990E-05	+5.7602010E-05
30.0	3	+5.1233320E-05	+4.1101562E-06	+5.5499986E-05	+4.7299996E-05	+5.7939396E-05
31.0	3	+5.9399986E-05	+2.0998355E-06	+6.0899998E-05	+5.6999997E-05	+5.8108082E-05
32.0	3	+4.8266650E-05	+2.8536005E-06	+5.1499999E-05	+4.6099987E-05	+5.8276767E-05
35.0	3	+6.3666651E-05	+2.1126171E-06	+6.5899992E-05	+6.1699989E-05	+5.8782839E-05
37.0	3	+6.0066653E-05	+1.0682770E-06	+6.0999998E-05	+5.8899997E-05	+5.9120211E-05
39.0	3	+5.7833327E-05	+1.2694547E-06	+5.9299985E-05	+5.7099998E-05	+5.9457597E-05
40.0	3	+6.0966659E-05	+1.7784401E-06	+6.2899998E-05	+5.9599988E-05	+5.9626283E-05
43.0	3	+6.1199985E-05	+3.2938739E-06	+6.4499996E-05	+5.7899989E-05	+6.0132355E-05
44.0	3	+6.3533327E-05	+2.4703820E-06	+6.5799991E-05	+6.0899998E-05	+6.0301041E-05

ANB 3066 PROPELLANT(ANT) TCLF BELOW GLASS POINT, LINED CARTONS



ANB 3066 PROPELLANT (ALL ANB) GLASS TRANSITION TEMPERATURE

Figure 7-8

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
13.0	6	-7.9166656E+01	+1.3291601E+00	-7.8000000E+01	-8.1000000E+01	-7.4730972E+01
16.0	3	-7.8666656E+01	+3.2145502E+00	-7.5000000E+01	-8.1000000E+01	-7.4770248E+01
17.0	12	-7.4583328E+01	+4.7950416E+00	-6.1000000E+01	-7.9000000E+01	-7.4783340E+01
18.0	12	-7.5500000E+01	+1.8829377E+00	-7.2000000E+01	-7.8000000E+01	-7.4796432E+01
19.0	3	-7.7000000E+01	+0.0000000E+19	-7.7000000E+01	-7.7000000E+01	-7.4809524E+01
20.0	6	-7.7166656E+01	+2.3166067E+00	-7.5000000E+01	-8.0000000E+01	-7.4822631E+01
21.0	12	-7.6333328E+01	+1.3026778E+00	-7.5000000E+01	-7.9000000E+01	-7.4835723E+01
22.0	9	-7.8000000E+01	+4.4158804E+00	-7.4000000E+01	-8.8000000E+01	-7.4848815E+01
23.0	9	-7.6666656E+01	+1.1180339E+00	-7.5000000E+01	-7.8000000E+01	-7.4861907E+01
24.0	6	-7.4500000E+01	+2.7386127E+00	-7.2000000E+01	-7.7000000E+01	-7.4875000E+01
25.0	6	-7.4333328E+01	+1.6329931E+00	-7.2000000E+01	-7.6000000E+01	-7.4888092E+01
27.0	3	-7.7000000E+01	+1.0000000E+00	-7.6000000E+01	-7.8000000E+01	-7.4914276E+01
28.0	6	-7.1833328E+01	+2.2286019E+00	-7.0000000E+01	-7.5000000E+01	-7.4927383E+01
29.0	3	-7.9666656E+01	+2.0816659E+00	-7.8000000E+01	-8.2000000E+01	-7.4940475E+01
30.0	3	-7.3000000E+01	+2.6457513E+00	-7.1000000E+01	-7.6000000E+01	-7.4953567E+01
31.0	9	-7.5333328E+01	+1.5811388E+00	-7.2000000E+01	-7.7000000E+01	-7.4966659E+01
33.0	11	-7.6181808E+01	+2.9263691E+00	-7.0000000E+01	-8.0000000E+01	-7.4992843E+01
34.0	7	-7.5857131E+01	+2.6095064E+00	-7.2000000E+01	-8.0000000E+01	-7.5005935E+01
35.0	4	-7.6500000E+01	+2.6457513E+00	-7.4000000E+01	-8.0000000E+01	-7.5019042E+01
36.0	5	-7.7500000E+01	+2.0736441E+00	-7.4000000E+01	-7.9000000E+01	-7.5032135E+01
37.0	4	-7.6250000E+01	+5.0000000E-01	-7.6000000E+01	-7.7000000E+01	-7.5045227E+01
38.0	6	-7.2833328E+01	+5.8452259E+00	-6.2000000E+01	-7.8000000E+01	-7.5058319E+01
39.0	3	-7.9333328E+01	+1.1547005E+00	-7.8000000E+01	-8.0000000E+01	-7.5071411E+01
41.0	3	-7.8000000E+01	+1.0000000E+00	-7.7000000E+01	-7.9000000E+01	-7.5097595E+01
42.0	1	-7.4000000E+01	+0.0000000E+99	-7.4000000E+01	-7.4000000E+01	-7.5110702E+01
43.0	3	-7.6333328E+01	+1.1547005E+00	-7.5000000E+01	-7.7000000E+01	-7.5123794E+01
45.0	1	-7.6000000E+01	+0.0000000E+07	-7.6000000E+01	-7.6000000E+01	-7.5149978E+01
47.0	4	-6.9750000E+01	+5.6789083E+00	-6.2000000E+01	-7.4000000E+01	-7.5176162E+01
48.0	3	-7.6000000E+01	+1.9999999E+00	-7.4000000E+01	-7.8000000E+01	-7.5189254E+01
49.0	6	-7.1500000E+01	+5.6480084E+00	-6.6000000E+01	-8.1000000E+01	-7.5202362E+01
50.0	3	-7.8000000E+01	+2.6457513E+00	-7.5000000E+01	-8.0000000E+01	-7.5215454E+01

ANB 3066 PROPELLANT (ALL ANB) GLASS TRANSITION TEMPERATURE

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
51.0	3	-7.4333328E+01	+2.0816659E+00	-7.2000000E+01	-7.6000000E+01	-7.5228546E+01
52.0	6	-7.7500000E+01	+5.3944415E+00	-7.1000000E+01	-8.3000000E+01	-7.5241638E+01
53.0	13	-7.3384613E+01	+4.3691811E+00	-6.5000000E+01	-7.9000000E+01	-7.5254730E+01
54.0	16	-7.1875000E+01	+4.2720018E+00	-6.5000000E+01	-7.8000000E+01	-7.5267822E+01
55.0	13	-7.3230758E+01	+4.4376015E+00	-6.7000000E+01	-8.1000000E+01	-7.5280914E+01
56.0	6	-7.8333328E+01	+1.7511900E+00	-7.7000000E+01	-8.1000000E+01	-7.5294021E+01
57.0	6	-7.5000000E+01	+1.6733200E+00	-7.3000000E+01	-7.7000000E+01	-7.5307113E+01
58.0	12	-7.3333328E+01	+4.1633319E+00	-6.2000000E+01	-7.8000000E+01	-7.5320205E+01
59.0	3	-6.6666656E+01	+5.0332229E+00	-6.2000000E+01	-7.2000000E+01	-7.5333297E+01
60.0	9	-7.8666656E+01	+1.9999999E+00	-7.5000000E+01	-8.1000000E+01	-7.5346389E+01
61.0	11	-7.5181808E+01	+4.8952667E+00	-6.9000000E+01	-8.4000000E+01	-7.5359481E+01
62.0	9	-7.4333328E+01	+2.8722813E+00	-6.8000000E+01	-7.9000000E+01	-7.5372573E+01
63.0	9	-7.9000000E+01	+2.1794494E+00	-7.6000000E+01	-8.2000000E+01	-7.5385665E+01
64.0	3	-7.4333328E+01	+1.5275252E+00	-7.3000000E+01	-7.6000000E+01	-7.5398773E+01
65.0	3	-7.3666656E+01	+2.0816659E+00	-7.2000000E+01	-7.6000000E+01	-7.5411865E+01
66.0	4	-7.3500000E+01	+3.4156502E+00	-6.9000000E+01	-7.7000000E+01	-7.5424957E+01
67.0	1	-7.4000000E+01	+0.0000000E+91	-7.4000000E+01	-7.4000000E+01	-7.5438049E+01
68.0	3	-7.7333328E+01	+1.1547005E+00	-7.6000000E+01	-7.8000000E+01	-7.5451141E+01
69.0	18	-7.4111099E+01	+3.3235149E+00	-6.8000000E+01	-8.0000000E+01	-7.5464233E+01
70.0	12	-7.4916656E+01	+5.5670839E+00	-5.8000000E+01	-7.8000000E+01	-7.5477325E+01
72.0	18	-7.5111099E+01	+6.1058206E+00	-5.6000000E+01	-8.1000000E+01	-7.5503524E+01
73.0	9	-7.4444442E+01	+5.7469798E+00	-6.3000000E+01	-7.9000000E+01	-7.5516616E+01
74.0	1	-7.9000000E+01	+0.0000000E+15	-7.9000000E+01	-7.9000000E+01	-7.5529708E+01
75.0	7	-7.4714279E+01	+3.4982989E+00	-7.0000000E+01	-7.8000000E+01	-7.5542800E+01
76.0	5	-7.6599990E+01	+3.2863353E+00	-7.3000000E+01	-7.9000000E+01	-7.5555892E+01
77.0	9	-7.6222213E+01	+3.8980051E+00	-7.0000000E+01	-8.0000000E+01	-7.5568984E+01
78.0	12	-7.6250000E+01	+2.7675062E+00	-7.2000000E+01	-8.2000000E+01	-7.5582092E+01
79.0	6	-7.2666656E+01	+1.0327955E+00	-7.2000000E+01	-7.4000000E+01	-7.5595184E+01
80.0	9	-6.8555541E+01	+5.2941267E+00	-5.7000000E+01	-7.4000000E+01	-7.5608276E+01
81.0	18	-7.2888885E+01	+6.0865221E+00	-5.6000000E+01	-7.9000000E+01	-7.5621368E+01
82.0	3	-7.8000000E+01	+1.0000000E+00	-7.7000000E+01	-7.9000000E+01	-7.5634460E+01

ANB 3066 PROPELLANT (ALL ANB) GLASS TRANSITION TEMPERATURE

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
83.0	4	-7.7000000E+01	+7.0237691E+00	-7.0000000E+01	-8.4000000E+01	-7.5647552E+01
84.0	6	-7.6666656E+01	+2.8751811E+00	-7.4000000E+01	-8.2000000E+01	-7.5660644E+01
85.0	3	-7.4000000E+01	+1.0000000E+00	-7.3000000E+01	-7.5000000E+01	-7.5673751E+01
86.0	3	-7.5666656E+01	+2.0816659E+00	-7.4000000E+01	-7.8000000E+01	-7.5686843E+01
87.0	13	-7.5307678E+01	+2.8978329E+00	-6.8000000E+01	-7.8000000E+01	-7.5699935E+01
88.0	9	-7.4666656E+01	+4.0311288E+00	-7.0000000E+01	-8.1000000E+01	-7.5713027E+01
89.0	21	-7.4857131E+01	+3.4682230E+00	-6.4000000E+01	-7.9000000E+01	-7.5726119E+01
90.0	9	-7.7444442E+01	+4.0034707E+00	-7.0000000E+01	-8.2000000E+01	-7.5739212E+01
91.0	6	-7.3166656E+01	+9.8319208E-01	-7.2000000E+01	-7.4000000E+01	-7.5752304E+01
93.0	3	-7.8333328E+01	+1.1547005E+00	-7.7000000E+01	-7.9000000E+01	-7.5778503E+01
94.0	9	-7.5000000E+01	+2.3452078E+00	-7.2000000E+01	-7.9000000E+01	-7.5791595E+01
95.0	12	-7.7083328E+01	+1.7816403E+00	-7.3000000E+01	-7.9000000E+01	-7.5804687E+01
96.0	18	-7.5611099E+01	+3.1648601E+00	-7.1000000E+01	-8.1000000E+01	-7.5817779E+01
97.0	3	-7.6000000E+01	+0.0000000E+03	-7.6000000E+01	-7.6000000E+01	-7.5830871E+01
98.0	6	-7.7833328E+01	+1.3291601E+00	-7.6000000E+01	-8.0000000E+01	-7.5843963E+01
100.0	3	-7.8333328E+01	+1.5275252E+00	-7.7000000E+01	-8.0000000E+01	-7.5870162E+01
101.0	3	-7.5666656E+01	+1.1547005E+00	-7.5000000E+01	-7.7000000E+01	-7.5883255E+01
102.0	3	-7.9333328E+01	+1.1547005E+00	-7.8000000E+01	-8.0000000E+01	-7.5896347E+01
104.0	3	-6.9333328E+01	+1.1547005E+00	-6.8000000E+01	-7.0000000E+01	-7.5922531E+01
105.0	12	-7.5833328E+01	+1.9462473E+00	-7.2000000E+01	-7.9000000E+01	-7.5935623E+01
106.0	6	-7.5833328E+01	+1.7224014E+00	-7.3000000E+01	-7.8000000E+01	-7.5948715E+01
107.0	3	-7.5333328E+01	+1.1547005E+00	-7.4000000E+01	-7.6000000E+01	-7.5961822E+01
109.0	9	-7.2000000E+01	+6.7268120E+00	-6.0000000E+01	-7.8000000E+01	-7.5988006E+01
110.0	6	-7.2666656E+01	+8.1649658E-01	-7.2000000E+01	-7.4000000E+01	-7.6001098E+01
111.0	12	-7.4416656E+01	+3.8247598E+00	-6.6000000E+01	-8.0000000E+01	-7.6014190E+01
112.0	3	-7.3333328E+01	+2.0816659E+00	-7.1000000E+01	-7.5000000E+01	-7.6027282E+01
113.0	15	-7.8000000E+01	+2.2990681E+00	-7.4000000E+01	-8.1000000E+01	-7.6040374E+01
114.0	3	-7.2333328E+01	+2.3094010E+00	-7.1000000E+01	-7.5000000E+01	-7.6053482E+01
115.0	6	-7.7333328E+01	+1.8618986E+00	-7.5000000E+01	-7.9000000E+01	-7.6066574E+01
116.0	6	-7.4500000E+01	+3.8340579E+00	-7.1000000E+01	-7.8000000E+01	-7.6079666E+01
117.0	9	-7.7777770E+01	+2.3863035E+00	-7.5000000E+01	-8.1000000E+01	-7.6092758E+01

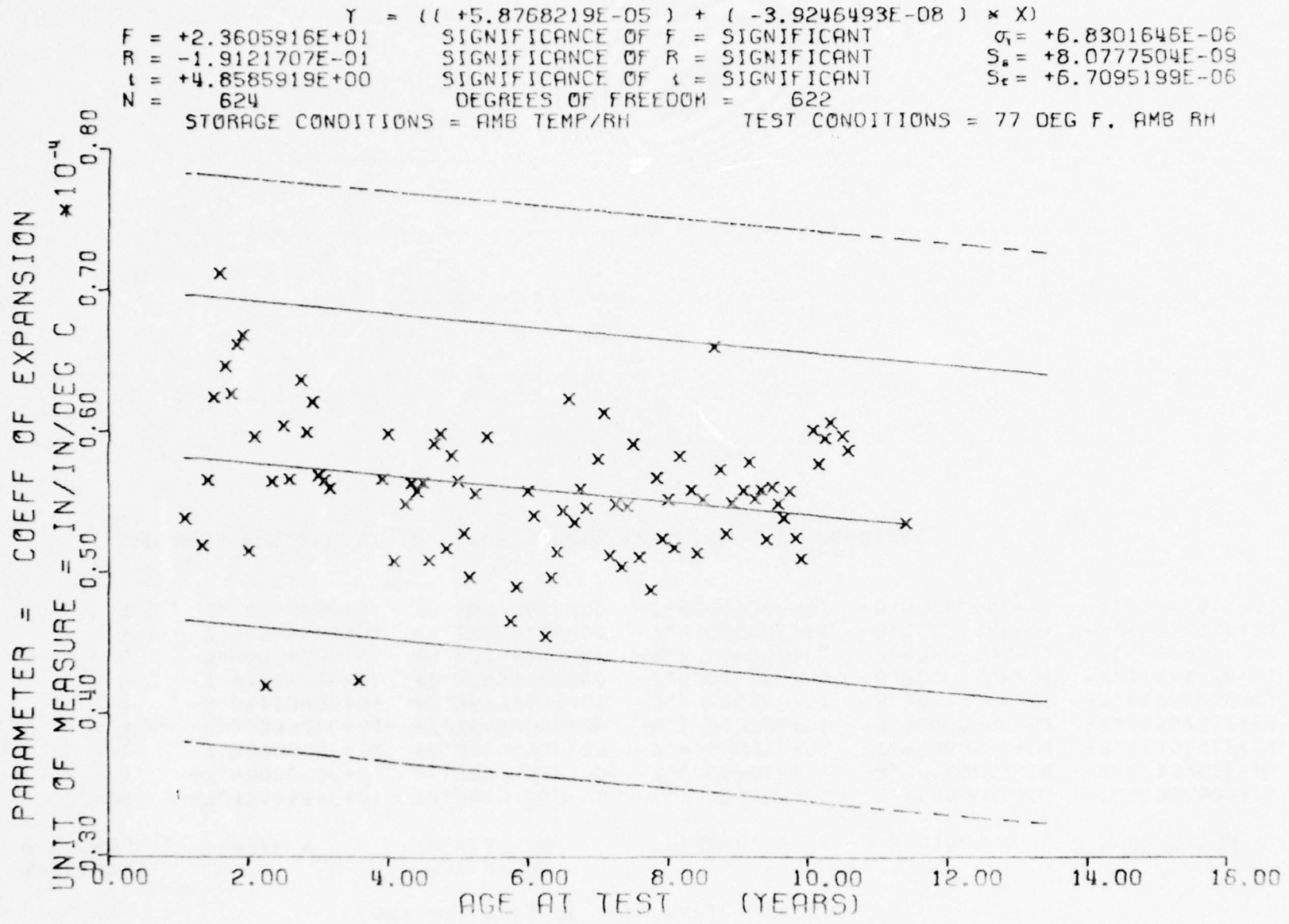
ANB 3066 PROPELLANT (ALL ANB) GLASS TRANSITION TEMPERATURE

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
118.0	15	-7.7066665E+01	+2.5485756E+00	-7.2000000E+01	-8.1000000E+01	-7.6105850E+01
119.0	3	-7.4000000E+01	+1.9999999E+00	-7.2000000E+01	-7.6000000E+01	-7.6118942E+01
121.0	1	-7.8000000E+01	+0.0000000E+83	-7.8000000E+01	-7.8000000E+01	-7.6145141E+01
122.0	3	-8.2333328E+01	+1.1547005E+00	-8.1000000E+01	-8.3000000E+01	-7.6158233E+01
123.0	9	-8.0111099E+01	+1.9649710E+00	-7.7000000E+01	-8.3000000E+01	-7.6171325E+01
124.0	6	-7.9333328E+01	+1.5055453E+00	-7.8000000E+01	-8.2000000E+01	-7.6184417E+01
126.0	6	-7.8833328E+01	+4.0824829E-01	-7.8000000E+01	-7.9000000E+01	-7.6210601E+01
127.0	3	-7.9666656E+01	+5.7735026E-01	-7.9000000E+01	-8.0000000E+01	-7.6223693E+01
137.0	9	-8.1888385E+01	+2.2607766E+00	-7.8000000E+01	-8.5000000E+01	-7.6354644E+01

ANB 3066 PROPELLANT (ALL ANB) GLASS TRANSITION TEMPERATURE



ANB 3066 PROPELLANT (ALL ANB) THERMAL COEFFICIENT OF LINEAR EXPANSION (BELOW GP)

Figure 7-9

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
13.0	6	+5.3916621E-05	+6.2753943E-06	+6.0799997E-05	+4.7499997E-05	+5.8258010E-05
16.0	3	+5.1966650E-05	+2.6632660E-06	+5.3699986E-05	+4.8599993E-05	+5.8140270E-05
17.0	12	+5.6624936E-05	+4.0034709E-06	+6.2699997E-05	+4.9999987E-05	+5.8101024E-05
18.0	12	+6.2508232E-05	+3.5568773E-06	+6.7799992E-05	+5.7099998E-05	+5.8061777E-05
19.0	3	+7.1266651E-05	+9.0687181E-07	+7.2099996E-05	+7.0259996E-05	+5.8022531E-05
20.0	6	+6.4733321E-05	+3.7419723E-06	+7.1699992E-05	+6.0599995E-05	+5.7983284E-05
21.0	12	+6.2741572E-05	+3.9486626E-06	+6.9899993E-05	+5.7699998E-05	+5.7944038E-05
22.0	9	+6.6222128E-05	+5.5745868E-06	+7.6699987E-05	+5.6499993E-05	+5.7904791E-05
23.0	9	+6.6888795E-05	+3.9360438E-06	+7.1299989E-05	+5.9699988E-05	+5.7865545E-05
24.0	6	+5.1583279E-05	+1.2947237E-05	+6.4699997E-05	+3.4699987E-05	+5.7826298E-05
25.0	6	+5.9716636E-05	+4.1448114E-06	+6.5499989E-05	+5.4099989E-05	+5.7787052E-05
27.0	3	+4.2033323E-05	+4.7647920E-06	+4.5499997E-05	+3.6599987E-05	+5.7708559E-05
28.0	6	+5.6533288E-05	+4.2836247E-06	+6.1099999E-05	+4.9299997E-05	+5.7669312E-05
30.0	3	+6.0499995E-05	+3.1430244E-06	+6.3299987E-05	+5.7099998E-05	+5.7590819E-05
31.0	9	+5.6677701E-05	+1.2959945E-05	+7.4999989E-05	+3.9199992E-05	+5.7551573E-05
33.0	9	+6.3733212E-05	+3.7361734E-06	+7.0599999E-05	+5.8899997E-05	+5.7473080E-05
34.0	3	+6.0033319E-05	+2.0852762E-07	+6.0199992E-05	+5.9799989E-05	+5.7433833E-05
35.0	3	+6.2166654E-05	+1.9292866E-06	+6.3699990E-05	+5.9599991E-05	+5.7394587E-05
36.0	6	+5.6949938E-05	+7.2962472E-06	+6.7499990E-05	+4.8799993E-05	+5.7355340E-05
37.0	3	+5.6633314E-05	+1.2344127E-06	+5.7999990E-05	+5.5599986E-05	+5.7316094E-05
38.0	6	+5.6049975E-05	+6.6662801E-06	+6.5999993E-05	+5.0399990E-05	+5.7276847E-05
43.0	3	+4.2399988E-05	+5.2847069E-06	+4.7299996E-05	+3.6799989E-05	+5.7080615E-05
47.0	3	+5.6666656E-05	+2.9397870E-06	+5.9099998E-05	+5.3399999E-05	+5.6923629E-05
48.0	3	+5.9899990E-05	+8.5766375E-06	+6.7299988E-05	+5.0499991E-05	+5.6884382E-05
49.0	6	+5.0883303E-05	+4.0878773E-06	+5.6299992E-05	+4.6199987E-05	+5.6845135E-05
51.0	3	+5.4333319E-05	+1.0944074E-05	+6.2599996E-05	+4.2399988E-05	+5.6766642E-05
52.0	6	+5.6399963E-05	+4.9435968E-06	+6.3499988E-05	+4.9999987E-05	+5.6727396E-05
53.0	12	+5.5824901E-05	+6.7602796E-06	+6.6999986E-05	+4.4399988E-05	+5.6688149E-05
54.0	15	+5.6439908E-05	+6.1620465E-06	+6.5299987E-05	+4.5999986E-05	+5.6648903E-05
55.0	12	+5.0916583E-05	+3.6674069E-06	+5.7499986E-05	+4.6599991E-05	+5.6609656E-05
56.0	6	+5.9199941E-05	+3.4376909E-06	+6.2999999E-05	+5.4099989E-05	+5.6570410E-05

ANB 3066 PROPELLANT (ALL ANB) THERMAL COEFFICIENT OF LINEAR EXPANSION (BELOW GP)

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
57.0	6	+5.9916594E-05	+2.6611937E-06	+6.3399987E-05	+5.7199998E-05	+5.6531163E-05
58.0	9	+5.1777693E-05	+3.9071397E-06	+5.6599994E-05	+4.3999985E-05	+5.6491917E-05
59.0	3	+5.8366655E-05	+3.9206569E-06	+6.2499995E-05	+5.4699994E-05	+5.6452670E-05
60.0	6	+5.6566583E-05	+2.2623002E-06	+5.9399986E-05	+5.3699986E-05	+5.6413424E-05
61.0	8	+5.2862422E-05	+7.6518538E-06	+6.3799991E-05	+4.2999992E-05	+5.6374177E-05
62.0	9	+4.9733236E-05	+6.3610258E-06	+6.0999998E-05	+4.5099994E-05	+5.6334931E-05
63.0	9	+5.5655444E-05	+3.1493921E-06	+6.1899991E-05	+5.1899987E-05	+5.6295684E-05
65.0	3	+5.9699988E-05	+7.9189182E-06	+6.8699999E-05	+5.3799987E-05	+5.6217191E-05
69.0	6	+4.6633300E-05	+2.7080220E-06	+5.0999995E-05	+4.3099993E-05	+5.6060205E-05
70.0	6	+4.9033318E-05	+4.3084001E-06	+5.2799994E-05	+4.3999985E-05	+5.6020959E-05
72.0	15	+5.5853233E-05	+5.2494332E-06	+6.8599998E-05	+4.7499997E-05	+5.5942466E-05
73.0	9	+5.4099931E-05	+6.2053731E-06	+5.9899990E-05	+4.1299994E-05	+5.5903219E-05
75.0	3	+4.5533321E-05	+7.5233595E-06	+5.4099989E-05	+3.9999998E-05	+5.5824726E-05
76.0	3	+4.9666661E-05	+1.2213629E-06	+5.0999995E-05	+4.8599991E-05	+5.5785480E-05
77.0	9	+5.1488837E-05	+5.1402858E-06	+5.9499987E-05	+4.3499996E-05	+5.5746233E-05
78.0	9	+5.4455478E-05	+5.0651894E-06	+6.0999998E-05	+4.6799992E-05	+5.5706987E-05
79.0	6	+6.2366598E-05	+3.7807496E-06	+6.6399996E-05	+5.6599994E-05	+5.5667740E-05
80.0	9	+5.3611060E-05	+7.0627172E-06	+6.6399996E-05	+4.4299988E-05	+5.5628494E-05
81.0	18	+5.5988784E-05	+6.8188093E-06	+6.8199995E-05	+4.4999993E-05	+5.5589247E-05
82.0	3	+5.4633317E-05	+2.7061202E-06	+5.7599987E-05	+5.2299990E-05	+5.5550000E-05
84.0	3	+5.8099991E-05	+1.8187427E-06	+6.0199992E-05	+5.6999997E-05	+5.5471507E-05
85.0	3	+6.1366648E-05	+2.8358293E-06	+6.3199986E-05	+5.8099991E-05	+5.5432261E-05
86.0	3	+5.1266644E-05	+6.1239834E-06	+5.5799988E-05	+4.4299988E-05	+5.5393014E-05
87.0	12	+5.4899923E-05	+5.4743172E-06	+6.2199993E-05	+4.4999993E-05	+5.5353768E-05
88.0	9	+5.0444388E-05	+6.8172401E-06	+6.0199992E-05	+4.2799991E-05	+5.5314521E-05
89.0	21	+5.4757067E-05	+7.7618801E-06	+6.9799993E-05	+4.2999992E-05	+5.5275275E-05
90.0	9	+5.9166559E-05	+5.2093016E-06	+6.9599991E-05	+5.3399999E-05	+5.5236028E-05
91.0	6	+5.1133247E-05	+6.5578822E-06	+6.0099991E-05	+4.0599992E-05	+5.5196782E-05
93.0	3	+4.8799993E-05	+4.8661364E-06	+5.1999988E-05	+4.3199994E-05	+5.5118289E-05
94.0	9	+5.6777716E-05	+6.4687665E-06	+6.9099987E-05	+4.8999994E-05	+5.5079042E-05
95.0	12	+5.2424918E-05	+5.0811790E-06	+5.9999991E-05	+4.3899999E-05	+5.5039796E-05

ANB 3066 PROPELLANT (ALL ANB) THERMAL COEFFICIENT OF LINEAR EXPANSION (BELOW GP)

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
96.0	15	+5.5233263E-05	+4.8590212E-06	+6.6399996E-05	+4.4399988E-05	+5.5000549E-05
97.0	3	+5.1799986E-05	+4.2884217E-06	+5.5499986E-05	+4.7099994E-05	+5.4961303E-05
98.0	6	+5.8299978E-05	+7.5985227E-06	+6.7499990E-05	+4.9999987E-05	+5.4922056E-05
100.0	3	+5.5899989E-05	+2.8928541E-06	+5.9199999E-05	+5.3799987E-05	+5.4843563E-05
101.0	3	+5.1399983E-05	+3.7400820E-06	+5.3899988E-05	+4.7099994E-05	+5.4804317E-05
102.0	3	+5.5233322E-05	+5.4269820E-06	+6.1499988E-05	+5.2099989E-05	+5.4765070E-05
104.0	3	+6.6033317E-05	+3.9256168E-06	+6.8299996E-05	+6.1499988E-05	+5.4686577E-05
105.0	12	+5.7349883E-05	+6.3187546E-06	+6.6199994E-05	+4.8499990E-05	+5.4647331E-05
106.0	6	+5.2766641E-05	+3.6474095E-06	+5.7399985E-05	+4.6799992E-05	+5.4608084E-05
107.0	3	+5.4966658E-05	+5.6959798E-07	+5.5599986E-05	+5.4499992E-05	+5.4568838E-05
109.0	9	+5.5844371E-05	+9.0857988E-06	+6.7799992E-05	+4.2199986E-05	+5.4490345E-05
110.0	6	+5.7883284E-05	+4.2391026E-06	+6.4099993E-05	+5.2299990E-05	+5.4451098E-05
111.0	12	+5.5249925E-05	+4.0103590E-06	+6.0699996E-05	+4.6999994E-05	+5.4411852E-05
112.0	3	+5.5899989E-05	+6.4466916E-06	+6.0299993E-05	+4.8499990E-05	+5.4372605E-05
113.0	15	+5.2386589E-05	+6.0595534E-06	+5.9999991E-05	+4.0299986E-05	+5.4333359E-05
114.0	3	+5.6066652E-05	+2.0029906E-06	+5.7999990E-05	+5.3999989E-05	+5.4294112E-05
115.0	6	+5.4899952E-05	+5.9822675E-06	+6.1599988E-05	+4.3999985E-05	+5.4254865E-05
116.0	6	+5.3866606E-05	+2.8020926E-06	+5.8899997E-05	+5.0299990E-05	+5.4215619E-05
117.0	9	+5.5766577E-05	+4.2585946E-06	+6.4299994E-05	+4.8099987E-05	+5.4176372E-05
118.0	15	+5.2439892E-05	+5.3291840E-06	+6.1899991E-05	+4.2099985E-05	+5.4137126E-05
119.0	3	+5.0966656E-05	+4.0266854E-07	+5.1199996E-05	+5.0499991E-05	+5.4097879E-05
121.0	1	+6.0099991E-05	+0.0000000E+35	+6.0099991E-05	+6.0099991E-05	+5.4019386E-05
122.0	3	+5.7699988E-05	+3.4043063E-06	+6.0999998E-05	+5.4199990E-05	+5.3980140E-05
123.0	9	+5.9555488E-05	+3.6383637E-06	+6.4299994E-05	+5.3499999E-05	+5.3940893E-05
124.0	6	+6.0683261E-05	+1.5181951E-06	+6.2799997E-05	+5.8299992E-05	+5.3901647E-05
126.0	6	+5.9733283E-05	+2.4770897E-06	+6.3299987E-05	+5.6399992E-05	+5.3823154E-05
127.0	3	+5.8699981E-05	+3.1605510E-06	+6.1999991E-05	+5.5699987E-05	+5.3783907E-05
137.0	9	+5.3522147E-05	+5.4206517E-06	+6.1999991E-05	+4.4099986E-05	+5.3391442E-05

ANB 3066 PROPELLANT (ALL ANB) THERMAL COEFFICIENT OF LINEAR EXPANSION (BELOW GP)

SECTION VIII

CASE LINER BONDS

Cartons of propellant were lined with SD-851-2 liner/V-45 rubber. In the preparation of these cartons there are marked irregularities in the liner with the liner frequently penatrating up to 0.3" into the propellant. Moreover, some of these liners are pink with varing degrees of tackiness while others are buff colored and usually with little tackiness.

Two reports (MANCP Report Nr. 357(76) and ASPC Report 0162-06SAAS-15, Addendum 1, April 1976) detail a cooperative study on several cartons which had this problem. In this report ANB and ANT cartons of several ages have been combined to obtain time to failure (Table 8-1). The stress to cause failure at 100 minutes is well above the alert limit for storage for both constant load tensile and constant load shear. Plots are shown in Figures 8-1 thru 8-4. All show a significant decrease. It may be possible in the next report to do lot analyses to pinpoint those lots in which early failure may occur.

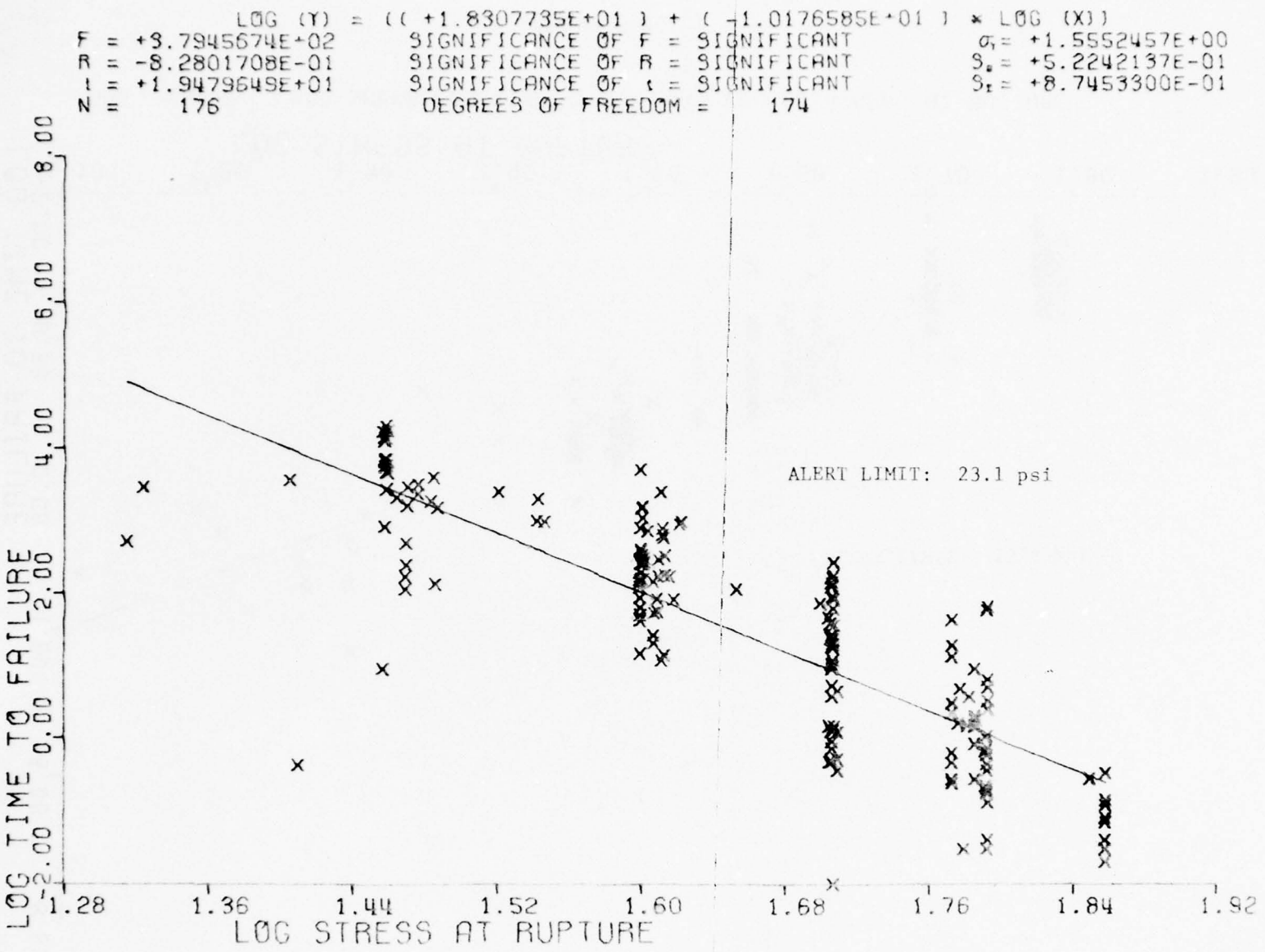
TABLE 8-1

SUMMARY OF REGRESSION ANALYSIS, STRESS VS TIME TO FAILURE

Test	PropInt Type	Intercept Mean a	Intercept Std Dev a	Slope Mean b	Slope Std Dev b	Std(1) error s_{yx}	Correl Coeff.	Nr of Spec	Predicted Stress To Cause Failure: Mean σ_1	95% Confidence Limits UL	LL	Mean σ_{100}	95% Confidence Limits UL	LL
Constant Load Tensile	ANB	18.308	0.868	-10.177	0.522	0.874	-0.828	176	69.951	130.230	58.942	40.038	52.369	23.760
	ANT	17.649	0.936	-9.356	0.529	0.930	-0.828	145	76.980	163.010	65.130	47.057	60.495	24.198
Constant Load Shear	ANB	12.282	0.375	-7.496	0.229	0.498	-0.906	234	43.504	60.857	33.120	23.535	17.807	9.651
	ANT	12.583	0.548	-7.469	0.332	0.438	-0.888	137	48.395	69.262	40.391	26.122	20.162	11.666

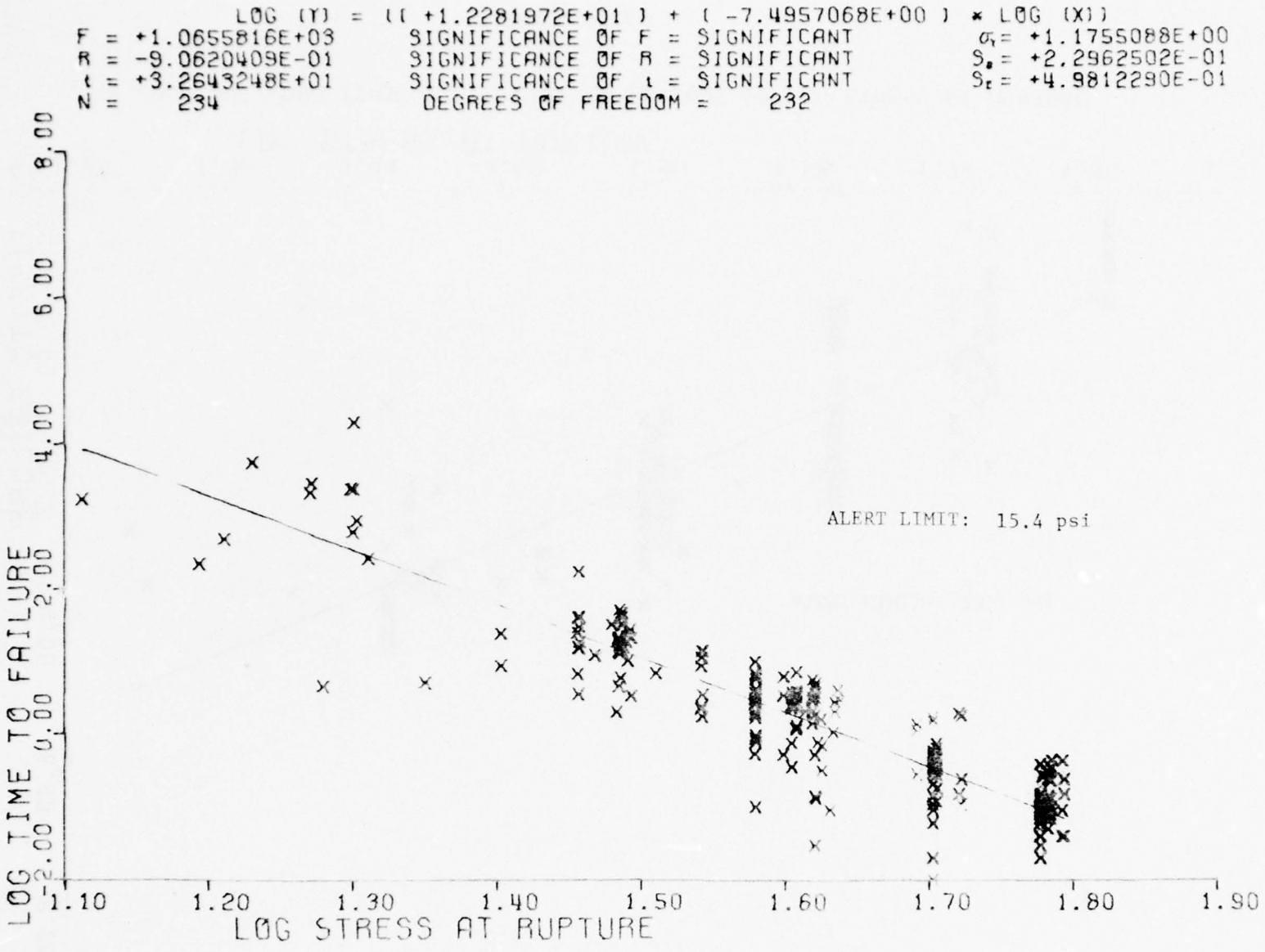
Regression Model: log(time to failure) = a + b(log stress, psi)

(1) Std error stated in terms of log time since time is dependent variable



ANB CONSTANT LOAD TENSILE LOG TIME TO FAILURE VS LOG STRESS AT RUPTURE

Figure 8-1



ANB CONSTANT LOAD SHEAR LOG TIME TO FAILURE VS LOG STRESS AT RUPTURE

Figure 8-2

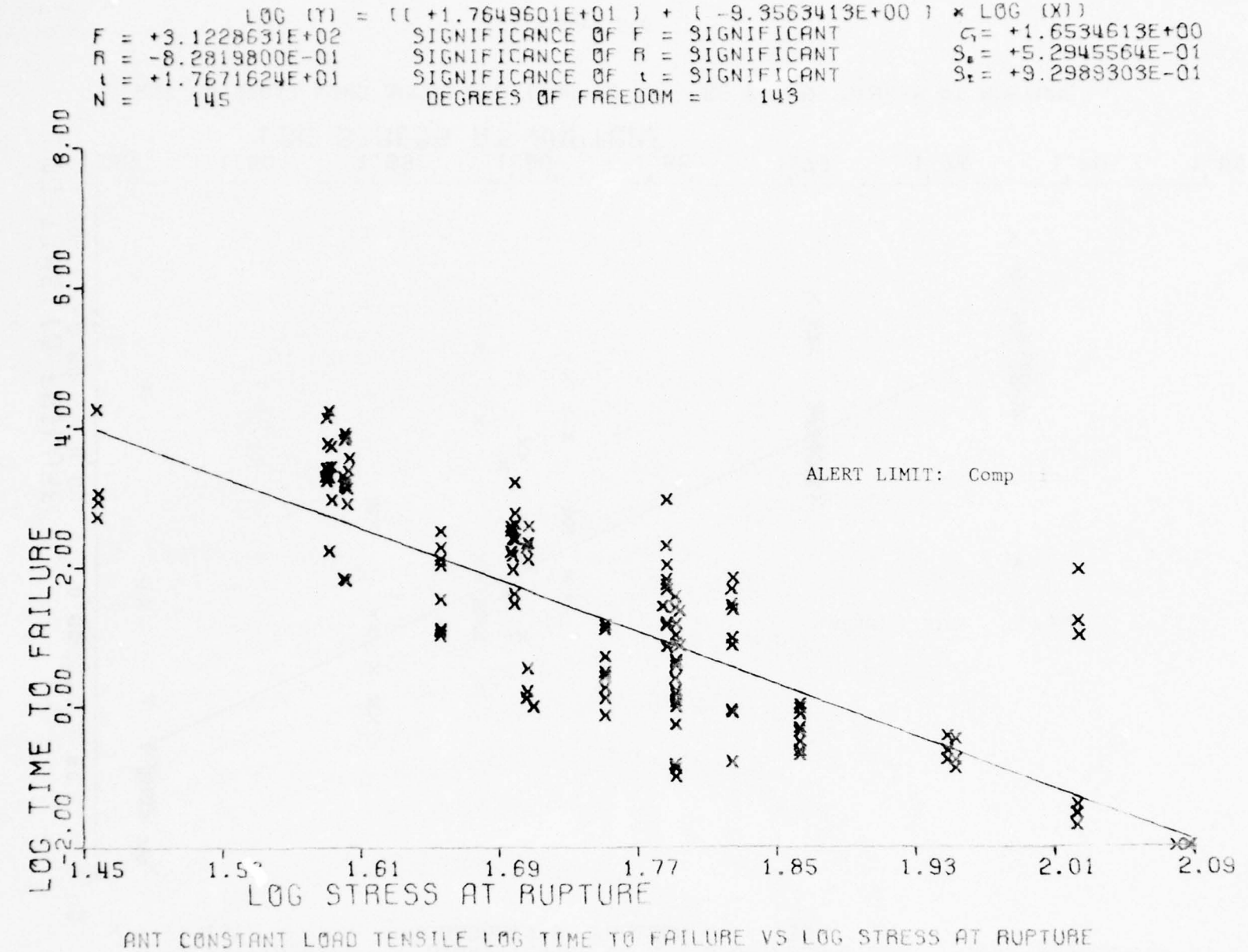

LOG (Y) = [+1.7649601E+01] + [-9.3563413E+00] × LOG (X)
F = +3.1228631E+02
R = -8.2819800E-01
t = +1.7671624E+01
N = 145
SIGNIFICANCE OF F = SIGNIFICANT
SIGNIFICANCE OF R = SIGNIFICANT
SIGNIFICANCE OF t = SIGNIFICANT
DEGREES OF FREEDOM = 143
σ = +1.6534613E+00
Sa = +5.2945564E-01
Sz = +9.2989303E-01
ALERT LIMIT: Comp
LOG TIME TO FAILURE
8.00
6.00
4.00
2.00
0.00
-2.00
1.45
1.53
1.61
1.69
1.77
1.85
1.93
2.01
2.09
LOG STRESS AT RUPTURE
ANT CONSTANT LOAD TENSILE LOG TIME TO FAILURE VS LOG STRESS AT RUPTURE

Figure 8-3

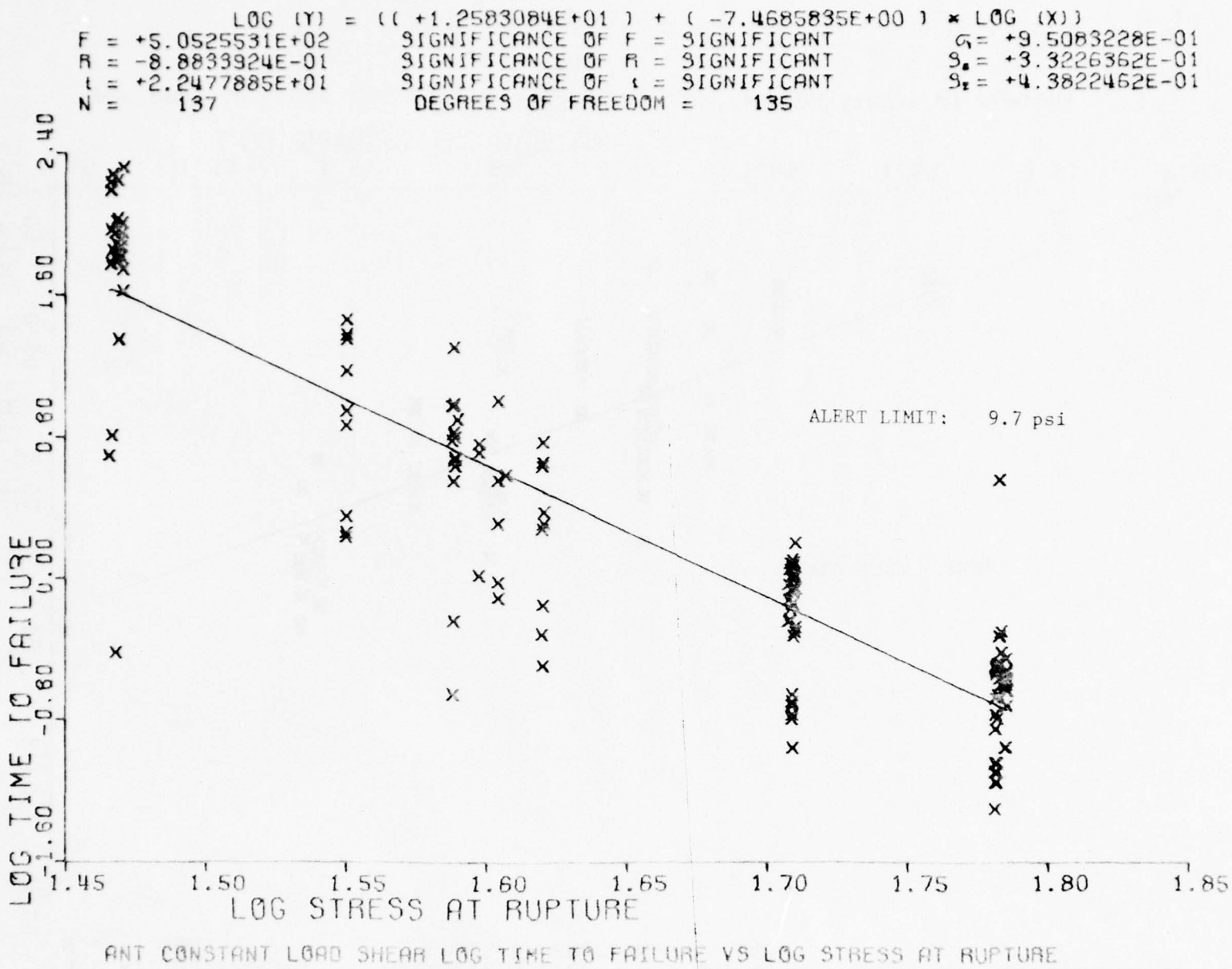

LOG (Y) = ((+1.2583084E+01) + (-7.4685835E+00) * LOG (X))
F = +5.0525531E+02
SIGNIFICANCE OF F = SIGNIFICANT
σ = +9.5083228E-01
R = -8.8833924E-01
SIGNIFICANCE OF R = SIGNIFICANT
S_a = +3.3226362E-01
t = +2.2477885E+01
SIGNIFICANCE OF t = SIGNIFICANT
S_z = +4.3822462E-01
N = 137
DEGREES OF FREEDOM = 135
ALERT LIMIT: 9.7 psi
LOG TIME TO FAILURE
2.40
1.60
0.80
0.00
-0.80
-1.60
1.45
1.50
1.55
1.60
1.65
1.70
1.75
1.80
1.85
LOG STRESS AT RUPTURE
ANT CONSTANT LOAD SHEAR LOG TIME TO FAILURE VS LOG STRESS AT RUPTURE

Figure 8-4

APPENDIX

ANALYSIS OF COVARIANCE

The results of the analysis of covariance as described in Section III are summarized in Table A-A. The number in each block refer to the table number of each analysis. The tables show the specific F ratio and an associated degrees of freedom for each statistical test conducted.

TABLE A-A

ANALYSIS OF COVARIANCE
SUMMARY OF SIGNIFICANCE

	VLR Tensile			HR Triax Tensile			Stress Relax 1% Strain		TCLE	
Propellant Group	Sm	er	E	Sm	er	E	E_{10}	E_{1000}	TCLE Above	Glass Point
ANT(Lined) vs ANT(Unlined)	1 Sig	2 Sig	3 Sig	28 Sig	29 Sig	30 Sig	55 Sig	56 Sig	69 Sig	70 Sig
ANB(Lined) vs ANT(Lined)	4 Sig	5 Sig	6 N.S.	31 Sig	32 Sig	33 Sig	57 Sig	58 Sig		
ANA(Unlined) vs ANB(Unlined)	7 Sig	8 Sig	9 Sig	34 Sig	35 Sig	36 Sig	59 Sig	60 Sig	71 Sig	72 Sig
ANA(Unlined) vs ANB(Unlined) vs ANT(Unlined)	10 Sig	11 Sig	12 Sig	37 Sig	38 Sig	39 Sig	61 Sig	62 Sig	73 Sig	74 Sig
ANB(Lined) Lot to Lot	13 Sig	14 Sig	15 Sig	40 Sig	41 Sig	42 Sig				
ANT(Lined) Lot to Lot	16 Sig	17 Sig	18 Sig	42 Sig	44 Sig	45 Sig	63 Sig	64 Sig		
ANA(Unlined Lot to Lot	19 Sig	20 Sig	21 Sig	46 Sig	47 Sig	48 Sig	65 Sig	66 Sig		
ANB(Unlined) Lot to Lot	22 Sig	23 Sig	24 Sig	49 Sig	50 Sig	51 Sig				
ANT(Unlined) Lot to Lot	25 Sig	26 Sig	27 Sig	52 Sig	53 Sig	54 Sig	67 Sig	68 Sig		

Blanks - Data not available for covariance analysis.

TABLE A-1

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
UNLND	323	46052.4375	18665.4375	24775.0000	322	17209.7422	53.4464	0.4053082E+00
LINED	77	5317.4375	1109.8125	4067.1250	76	3805.4932	50.0723	0.2087119E+00
WITHIN	400	51369.8750	19775.2500	28812.1250	399	21199.4844	53.1315	0.3845500E+00
AMONG	1	4153.1250	3569.7500	3065.8750	0	2.4434	0.0000	0.0000000E+00
TOTAL	401	55523.0000	23345.0000	31878.0000	400	22062.4453	55.1561	0.0000000E+00

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 3.4894 DF = 1, 398
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 16.2420 DF = 1, 399
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 143.2791 DF = 1, 399

ANT LINED VS UNLINED CARTONS VLR TENSILE 77 DEG F, 0.0002 IN/MIN, MAXIMUM STRESS

TABLE A-2

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
UNLIKE	324	0.46[illegible]+03	0.[illegible]+02	0.[illegible]+00	324	0.[illegible]+00	0.[illegible]-03	0.[illegible]-03
LIKED	77	0.5317[illegible]+04	-.2736[illegible]+01	0.[illegible]-01	76	0.152504E-01	0.200664E-03	-.5146[illegible]-04
WITHIN	400	0.5136[illegible]+03	0.1[illegible]+02	[illegible]+00	399	0.1240[illegible]+00	0.3[illegible]-03	0.[illegible]-03
AMONG	1	0.41[illegible]+04	0.216[illegible]+01	[illegible]+02	0	0.5341[illegible]-05	0.000000E+00	0.[illegible]-04
TOTAL	401	0.56[illegible]+03	0.[illegible]+02	0.[illegible]+00	400	0.124137E+00	0.[illegible]-03	0.[illegible]-03

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 14.8712 DF = 1, 399

F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 0.3456 DF = 1, 399

F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 20.6161 DF = 1, 399

ANT LIKED VS UNLIKED CANIONS VER TENSILE 77 DEG F .0002 IN/MIN. STRAIN AT RUPTRE

TABLE A-3

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
COMBINED	325	0.4605[illegible]E+05	0.1[illegible]956E+06	0.9[illegible]557E+07	322	0.7[illegible]152E+07	0.7955082E+04	0.3321387E+01
LINES	77	0.5217[illegible]E+04	0.2[illegible]675E+05	0.[illegible]E+06	76	0.3[illegible]E+06	0.[illegible]E+04	0.[illegible]E+01
WITHIN	400	0.5[illegible]E+05	0.[illegible]E+06	0.[illegible]E+07	399	0.[illegible]E+07	0.7277[illegible]E+04	0.[illegible]E+01
AMONG	1	0.41[illegible]E+04	0.2[illegible]E+05	0.[illegible]E+06	0	0.[illegible]E+02	0.0000000E+00	0.[illegible]E+01
TOTAL	401	0.5552[illegible]E+05	0.1[illegible]331E+06	0.[illegible]374[illegible]E+07	400	0.[illegible]E+07	0.[illegible]E+04	0.[illegible]E+01

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 0.2101 DF = 1, 399

F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 3.4606 DF = 1, 399

F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 41.6453 DF = 1, 399

ANT LINES VS UNLINED CANYONS VLR TENSILE 77 DEG F, 0.0002 IN/IN, MODULUS

TABLE A-4

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
AEB	127	0.166E69E+05	0.357937E+04	0.5E6194E+04	126	0.429415E+04	0.340606E+02	0.2145024E+00
ABT	77	0.531744E+04	0.110969E+04	0.403567E+04	76	0.3E043CE+04	0.500565E+02	0.2086884E+00
WITHIN	204	0.220044E+05	0.468906E+04	0.9097C1E+04	203	0.F098C9E+04	0.398945E+02	0.2130976E+00
AMONG	1	0.63421cE+01	0.519062E+03	0.424c07E+03	0	-.65C635E-01	0.000000E+00	0.8183072E+00
TOTAL	205	0.2c5385E+05	0.520812E+04	0.952250E+04	204	0.832434E+04	0.40E056E+02	0.2300548E+00

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 0.0036 DF = 1, 202
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 5.6588 DF = 1, 203
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = <5.0466 DF = 1, 203

AEB VS ABT LIVED CARTONS VLR TENSILE 77 DEG F, .0002 IN/MIN, MAXIMUM STRESS

TABLE A-5

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
ANE	127	0.1[illegible]E+05	-.112332E+02	0.558453E-01	126	0.482834E-01	0.383202E-03	-.573173[illegible]E-0[illegible]
ANT	77	0.531744E+03	-.273779E+01	0.[illegible]E57E-01	76	0.256364E-02	0.337321E-04	-.514[illegible]E-0[illegible]
WITHIN	204	0.22[illegible]E+05	-.139709E+02	0.725150E-01	203	0.[illegible]E34EE-01	0.312471[illegible]-03	-.[illegible]3491[illegible]E-0[illegible]
ANEVS	1	0.[illegible]34125E+03	-.5[illegible]2[illegible]E+00	0.147[illegible]E-02	0	.2[illegible]221E-0[illegible]	0.[illegible]E+00	-.1528474E-02
TOTAL	205	0.22[illegible]E+05	-.149392E+02	0.[illegible]32E-01	204	0.[illegible]1248E-01	0.[illegible]4337[illegible]-03	-.[illegible]598[illegible]91E-0[illegible]

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 50.6010 DF = 1, 202
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 1.5[illegible]39 DF = 1, 203
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = [illegible]E.2974 DF = 1, 203

ANE VS ANT LINED CARTONS VLR TENSILE 77 DEG F, .0002 IN/MIN, STRAIN AT RUPTURE

TABLE A-6

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS x	xy	y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
ANB	122	0.1402E3E+05	0.457896E+05	0.[illegible]560E+0[illegible]	121	0.701783E+06	0.579966E+04	0.3357697E+01
ANT	77	0.523744E+04	0.206750E+05	0.820992E+06	76	0.340604E+06	0.448164E+04	0.3882150E+01
WITHIN	199	0.201457E+05	0.764640E+05	0.128595E+07	198	0.104349E+07	0.527015E+04	0.3497710E+01
AMONG	1	0.772312E+03	0.615500E+04	0.[illegible]5E+0[illegible]	0	.128281E+02	0.000000E+00	0.8021362E+01
TOTAL	200	0.209181E+05	0.766590E+05	0.133563E+07	199	0.105870E+07	0.532019E+04	0.3664727E+01

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 0.2081 DF = 1, 197
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 2.8857 DF = 1, 198
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 46.7658 DF = 1, 19[illegible]

ANB VS ANT LINED CARTONS VLR TENSILE 77 DEG F, .0002 IN/MIN, MODULUS

TABLE A-7

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS x	XY	Y	DEVIATIONS ABOUT REGRESSION DF	SS	MS	REGRESSION COEFFICIENT
ANA	271	97048.0000	8510.6125	10114.0000	270	9367.6250	34.6949	0.8769512E-01
A1B	1631	444191.0000	53146.0000	106951.0000	1630	100592.2500	61.7130	0.1196467E+00
WITHIN	1902	541239.0000	61656.6125	117065.0000	1901	110041.1875	57.8859	0.1139179E+00
AMONG	1	48682.0000	-927.6125	20.0000	0	2.8172	0.0000	0.5000000E+00
TOTAL	1903	589921.0000	60729.0000	117085.0000	1902	110833.2812	58.2720	0.5000000E+00

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 1.4050 DF = 1, 1901
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 13.6857 DF = 1, 1901
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 121.3386 DF = 1, 1901

A1A VS A2B UNLINED CARTONS VLR TENSILE 77 DEG F, 0.0002 IN/MIN, MAXIMUM STRESS

TABLE A-8

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DEVIATIONS ABOUT REGRESSION DF	SS	MS	REGRESSION COEFFICIENT
ANA	271	97048.0000	3.0476	0.0782	270	0.0781	0.0003	0.3140001E-04
ANB	1633	444301.0000	91.7578	0.9269	1632	0.9079	0.0006	0.2065200E-03
WITHIN	1904	541349.0000	94.8054	1.0052	1903	0.9886	0.0005	0.1751300E-03
AMONG	1	48754.0000	-9.9265	0.0021	0	0.0001	0.0000	0.0000000E+00
TOTAL	1905	590103.0000	84.8789	1.0072	1904	0.9950	0.0005	0.0000000E+00

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 4.9042 DF = 1, 1902
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 12.3084 DF = 1, 1903
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 31.9601 DF = 1, 1903

ANA VS ANB UNLINED CARTONS VLR TENSILE 77 DEG F 0.0002 IN/MIN, STRAIN AT RUPTURE

TABLE A-9

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
ANA	271	9704.8006	3347.5996	138936.0000	270	137781.2500	510.3009	0.3449427E+00
ANB	1635	44448.2031	4329.5996	2040576.0000	1634	2040154.0000	1248.5640	0.9740776E-01
WITHIN	1906	54153.0000	7677.1992	2179512.0000	1905	2178426.0000	1143.5288	0.1417686E+00
AMONG	1	4877.0996	5209.1992	5576.0000	0	12.0898	0.0000	0.0000000E+00
TOTAL	1907	59030.0937	12886.3984	2185088.0000	1906	2182274.0000	1144.9452	0.0000000E+00

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 0.4286 DF = 1, 1904
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 3.3676 DF = 1, 1905
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 0.9518 DF = 1, 1905

ANA VS ANB UNLINED CARTONS VLR TENSILE 77 DEG F 0.0002 IN/MIN. MODULUS

TABLE A-10

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DEVIATIONS ABOUT REGRESSION DF	SS	MS	REGRESSION COEFFICIENT
A1A	271	97046.0000	8510.6250	19113.0000	270	9366.6602	34.6913	0.8769500E-01
A1B	1631	444191.0000	55146.0000	106951.0000	1630	100592.2500	61.7130	0.1196467E+00
A1T	323	46052.4375	18665.4375	24776.0000	322	17210.7422	53.4495	0.4053082E+00
WITHIN	2225	587291.5000	80322.0625	149840.0000	2224	131654.5937	58.8375	0.1367689E+00
AMONG	2	65975.5625	5111.9375	2131.0000	1	1734.9150	1734.9150	0.0000000E+00
TOTAL	2227	653267.0000	85434.0000	143971.0000	2226	132797.9375	59.6577	0.0000000E+00

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 32.1932 DF = 2, 2224
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 16.5145 DF = 2, 2224
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 186.7074 DF = 1, 2224

A1A VS A1B & A1T UNLINED CARTONS VLH TENSILE 77 DEG F 0.0002 IN/MIN, MAX STRESS

TABLE A-11

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
A%A	271	0.3704E0[illegible]+05	0.304907E+01	0.7[illegible]509E-01	270	0.7[illegible]551E-01	0.2894[illegible]E-03	0.3141[illegible]E-06
A%B	1633	0.4493[illegible]E+05	0.92[illegible]51EE+02	[illegible].925735E+00	1632	[illegible].90[illegible]59E+00	0.555[illegible]78E-03	0.207[illegible]81E-03
A%T	323	0.45[illegible]524E+05	0.20[illegible]795E+02	0.113773E+00	322	0.104307E+00	0.323933E-03	0.4533934E-03
WITHIN	2275	0.87[illegible]14[illegible]+05	0.11[illegible]281E+03	0.211773E+01	2274	0.9[illegible]3[illegible]5EF+00	0.4235[illegible]E-03	0.1975576E-03
AMONG	4	0.66[illegible]936E+05	0.EE[illegible]964E+01	[illegible].183945E-01	1	0.376784E-01	0.17[illegible]4E-01	0.1040894E-03
TOTAL	2229	0.653455E+05	0.123160E+03	[illegible].113[illegible]5E+01	2228	0.111294E+01	0.499525E-03	0.1884[illegible]E-03

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 5.1441 DF = 50, 2224
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 7.[illegible]937 DF = [illegible]46, 2274
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 365.2[illegible]60 DF = 1, 2274

ANA VS ANB%ANT UNLINED CARTONS VLF TENSILE 77 DEG F .[illegible]002 IN/MIN, STR AT RUPTURE

TABLE A-12

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
ANA	271	0.9794E0E+05	0.3347EEE+05	0.139534E+07	27E	0.137780E+07	0.510295E+04	0.3449427E+00
ANB	1635	0.4494E2E+06	0.4579ZEE+05	0.2E4E147E+08	1634	0.2E4E0EE+08	0.124647E+05	0.103E233E+01
ANT	323	0.4E0524E+05	0.152958E+0E	0.3E6550E+07	322	0.25E155E+07	0.795513E+04	0.3321387E+01
WITHIN	2229	0.5E7582E+05	0.232228E+0E	0.248E37E+08	222E	0.247719E+08	0.1111E4E+05	0.3952228E+00
AMONG	2	0.6E1276E+05	0.511340E+05	0.558E80E+05	1	0.163480E+05	0.1634E0E+05	0.7732630E+00
TOTAL	2231	0.652710E+06	0.2833E0E+06	0.249196E+08	2230	0.2479E7E+08	0.1111SEE+05	0.4534647E+00

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 19.7780 DF = 2, 222E

F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 1.1171 DF = 2, 222E

F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = E.2548 DF = 1, 222E

ANA VS ANBSANT UNLINED CARTONS VEF TENSILE 77 DEG F .0002 IN/MIN. MODULUS

TABLE A-13

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
CWT	11	0.39[illegible]+04	0.E7D5E0E+03	0.[illegible]+03	10	0.[illegible]+03	0.[illegible]+02	0.[illegible]
CRO	14	0.35[illegible]+04	0.2[illegible]+03	0.[illegible]+03	13	0.[illegible]+03	0.[illegible]+02	0.[illegible]
CR2	11	0.[illegible]+03	0.[illegible]+03	0.[illegible]+03	10	0.[illegible]+03	0.[illegible]+02	0.[illegible]
CR4	11	0.25[illegible]+03	0.[illegible]+03	0.[illegible]+03	10	0.[illegible]+03	0.[illegible]+02	0.[illegible]
CR6	11	0.93[illegible]+03	0.3[illegible]+03	0.[illegible]+03	10	0.[illegible]+03	0.[illegible]+02	0.[illegible]
CR8	5	0.13[illegible]+02	0.[illegible]+02	0.[illegible]+03	4	0.[illegible]+01	0.[illegible]+01	0.[illegible]
CR7	3	0.16[illegible]+03	0.[illegible]+03	0.[illegible]+03	7	0.[illegible]+02	0.[illegible]+01	0.[illegible]
CR1	5	0.12[illegible]+02	-.[illegible]+02	0.[illegible]+02	4	0.[illegible]+01	0.[illegible]+01	-.[illegible]
CR3	5	0.37[illegible]+03	0.[illegible]+03	-.[illegible]+03	4	0.[illegible]+02	0.[illegible]+01	0.[illegible]
WITHIN	61	0.92[illegible]+04	0.2[illegible]+04	0.[illegible]+04	60	0.[illegible]+04	0.[illegible]+02	0.[illegible]
AMONG	8	0.45[illegible]+04	0.[illegible]+03	0.[illegible]+03	7	0.[illegible]+03	0.[illegible]+02	0.[illegible]
TOTAL	69	0.13[illegible]+05	0.[illegible]+04	0.[illegible]+04	68	0.[illegible]+04	0.[illegible]+02	0.[illegible]

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 7.3583 DF = [illegible]

F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 1.0511 DF = [illegible]

F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 17.9673 DF = [illegible]

AND CWT CRS (CT-TO-CT VER TENSILE MAX STRESS, 0.0002 IN/*IN, 77 DEG F

TABLE A-14

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	SS	REGRESSION COEFFICIENT
[illegible]	11	0.[illegible]E+04	-.2[illegible]E+00	0.[illegible]E-03	10	0.7[illegible]E-03	0.78[illegible]E-04	-.9[illegible]E-04
[illegible]	14	0.[illegible]E+04	-.2[illegible]E+01	0.[illegible]E-02	13	0.4[illegible]E-02	0.7[illegible]E-03	-.[illegible]E-03
[illegible]	11	0.[illegible]E+03	-.1[illegible]E+01	0.[illegible]E-02	10	0.2[illegible]E-02	0.2[illegible]E-03	-.[illegible]E-03
[illegible]	11	0.[illegible]E+03	-.7[illegible]E+00	0.[illegible]E-03	10	0.5[illegible]E-03	0.[illegible]E-04	-.[illegible]E-03
[illegible]	11	0.[illegible]E+03	-.[illegible]E+00	0.[illegible]E-03	10	0.3[illegible]E-02	0.3[illegible]E-03	-.[illegible]E-03
[illegible]	5	0.1[illegible]E+04	-.5[illegible]E-01	0.[illegible]E-03	4	0.3[illegible]E-04	0.[illegible]E-05	-.[illegible]E-03
[illegible]	6	0.1[illegible]E+04	-.2[illegible]E+00	0.[illegible]E-02	7	0.1[illegible]E-02	0.2[illegible]E-03	-.[illegible]E-03
[illegible]	5	0.1[illegible]E+04	0.7[illegible]E-01	0.[illegible]E-03	4	0.1[illegible]E-03	0.4[illegible]E-04	0.[illegible]E-02
[illegible]	5	0.[illegible]E+03	0.2[illegible]E+00	0.[illegible]E-04	4	0.4[illegible]E-03	0.1[illegible]E-03	0.[illegible]E-02
WITHIN	81	0.92[illegible]E+04	-.[illegible]E+01	0.[illegible]E-01	80	0.2[illegible]E-01	0.290[illegible]E-03	-.[illegible]E-03
AMONG	8	0.[illegible]E+04	-.[illegible]E+01	0.[illegible]E-01	7	0.9[illegible]E-02	0.1[illegible]E-02	0.[illegible]E+00
TOTAL	89	0.1[illegible]E+05	-.1[illegible]E+02	0.[illegible]E-01	87	0.3[illegible]E-01	0.3[illegible]E-03	0.[illegible]E+00

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 6.5011 DF = 8, 72

F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 4.4133 DF = 8, 80

F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 15.2461 DF = 1, 80

ADJUSTED TOT-TO-TOT VELOCITY AT RUPTURE, 0.0002 IN/MIN, 77 DEG F

TABLE A-15

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRELATED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
[illegible]	10	0.3[illegible]E+04	0.5[illegible]E+04	0.[illegible]E+05	9	0.1[illegible]E+05	0.2[illegible]E+04	0.1[illegible]E+01
[illegible]	13	0.3[illegible]E+04	0.[illegible]E+04	0.[illegible]E+05	12	0.[illegible]E+05	0.5[illegible]E+04	0.[illegible]E+01
[illegible]	14	0.8[illegible]E+03	0.5[illegible]E+04	0.[illegible]E+04	13	0.4[illegible]E+04	0.4[illegible]E+04	0.[illegible]E+01
[illegible]	12	0.2[illegible]E+03	0.3[illegible]E+04	0.[illegible]E+05	11	0.[illegible]E+05	0.[illegible]E+04	0.[illegible]E+01
[illegible]	11	0.9[illegible]E+02	0.7[illegible]E+04	0.[illegible]E+05	10	0.[illegible]E+05	0.[illegible]E+04	0.[illegible]E+01
[illegible]	5	0.1[illegible]E+02	0.5[illegible]E+03	0.[illegible]E+05	4	0.4[illegible]E+03	0.[illegible]E+03	0.[illegible]E+01
[illegible]	8	0.1[illegible]E+03	0.[illegible]E+04	0.[illegible]E+05	7	0.[illegible]E+04	0.[illegible]E+03	0.[illegible]E+01
[illegible]	5	0.1[illegible]E+02	-.2[illegible]E+03	0.[illegible]E+04	4	0.[illegible]E+04	0.[illegible]E+03	-.2[illegible]E+01
[illegible]	5	0.3[illegible]E+02	0.7[illegible]E+03	0.[illegible]E+05	4	0.[illegible]E+05	0.[illegible]E+04	0.[illegible]E+01
WITHIN	79	0.[illegible]E+04	0.[illegible]E+05	0.[illegible]E+06	78	0.[illegible]E+06	0.[illegible]E+04	0.[illegible]E+01
AMONG	6	0.[illegible]E+04	0.[illegible]E+05	0.[illegible]E+06	7	0.[illegible]E+05	0.[illegible]E+04	0.[illegible]E+01
TOTAL	87	0.[illegible]E+05	0.[illegible]E+05	0.[illegible]E+06	86	0.[illegible]E+06	0.[illegible]E+04	0.[illegible]E+01

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 7.0123 DF = 6, 78

F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 1.9936 DF = 6, 78

F RATIO FOR TESTING SIGNIFICANCE OF COVARIANCE = <5.7364 DF = 1, 78

ANALYSIS CONSIDERED NOT FEASIBLE BECAUSE: 0.0162 IN/MIN. 77 DEG F

TABLE A-16

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
711	11	435.0000	342.5391	1238.6523	10	968.9214	96.8921	0.7874460E+00
712	11	312.0000	-43.7930	106.7383	10	100.5914	10.0591	-.1403620E+00
713	11	350.2500	2.1996	98.3125	10	98.2987	9.8299	0.6276990E-02
819	11	824.2500	676.7109	661.1836	10	105.6028	10.5603	0.8210020E+00
820	11	726.2500	273.0742	177.7422	10	75.3467	7.5347	0.3749739E+00
821	5	1.5000	-0.9220	39.4375	4	38.8708	9.7177	-.6145833E+00
823	5	1.5000	3.2656	15.8047	4	8.6953	2.1738	0.2177083E+01
824	5	13.5000	30.6750	126.9375	4	56.3253	14.0813	0.2287037E+01
WITHIN	70	2666.2500	1283.9492	2484.8086	69	1846.5151	26.7611	0.0000000E+00
AMONG	7	2651.1875	-174.0117	1588.3789	8	1556.9575	259.4929	0.0000000E+00
TOTAL	77	5317.4375	1109.9375	4033.1875	78	3801.5039	50.0198	0.0000000E+00

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 2.4015 DF = 7, 62
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 10.4362 DF = 7, 69
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 23.1042 DF = 1, 69

ANT LINED CARTONS VLR TENSILE 77 DEG F, 0.0002 IN/MIN, LOT-TO-LOT MAXIMUM STRESS

TABLE A-17

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
711	11	0.435000E+03	-.666462E+00	0.243102E-02	10	0.135573E-02	0.135573E-03	-.157074E-03
712	11	0.312000E+03	-.147552E-01	0.487777E-03	10	0.467079E-03	0.467079E-04	-.472544E-04
713	11	0.350250E+03	0.617371E-01	0.764934E-03	10	0.774051E-03	0.774051E-04	0.176257E-03
715	11	0.[illegible]E+03	-.113[illegible]E+01	0.[illegible]E-04	10	0.79[illegible]E-03	0.79[illegible]E-04	-.145449[illegible]E-02
820	11	0.782250E+03	-.787869E+00	0.581031E-03	10	0.233715E-03	0.233715E-04	-.101326[illegible]E-02
824	5	0.135000E+02	0.268430E-01	0.506222E-03	4	0.452825E-03	0.113206E-03	0.198579[illegible]E-02
WITHIN	60	0.286325E+04	-.254937E+01	0.771511E-02	59	0.527475E-02	0.[illegible]940[illegible]5E-04	-.957239[illegible]E-02
AMONG	5	0.212584E+04	-.295356E+00	0.666453E-02	4	0.[illegible]0235[illegible]E-02	0.150567[illegible]E-02	-.138936[illegible]E-02
TOTAL	65	0.479[illegible]09E+04	-.284473E+01	0.237796E-01	64	0.1[illegible]0899E-01	0.188904E-03	-.594000AE-02

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 3.1781 DF = 5, 54
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 15.2459 DF = 5, 59
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 27.2963 DF = 1, 59

ANT LINED CAPTONS LOT-TO-LOT VER TENSILE 77 DEG F .0002 IN/MIN, STRAIN AT RPTURE

TABLE A-18

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
T11	11	0.465000E+03	0.334800E+04	0.276540E+05	10	0.109595E+04	0.109594E+03	0.769855E+01
T12	11	0.312000E+03	0.514000E+03	0.899700E+04	10	0.514022E+04	0.514021E+03	0.164743E+01
T13	11	0.350250E+03	0.113075E+04	0.365100E+05	10	0.267918E+04	0.267918E+03	0.339971E+01
R19	11	0.325250E+03	0.758600E+04	0.650700E+05	10	0.770419E+04	0.770419E+03	0.988[illegible]E+01
R20	11	0.728250E+03	0.549850E+04	0.422140E+05	10	0.207667E+05	0.207667E+04	0.755029[illegible]E+01
R24	5	0.125000E+02	0.120000E+03	0.159400E+04	4	0.527333E+03	0.131833E+03	0.688888E+01
WITHIN	60	0.266325E+04	0.186572E+05	0.214448E+06	59	0.837457E+05	0.141942E+04	0.700544[illegible]E+01
AMONG	5	0.212584E+04	0.329231E+04	0.482400E+05	4	0.431412E+05	0.107853E+05	0.154870[illegible]E+01
TOTAL	65	0.479909E+04	0.219496E+05	0.262680E+06	64	0.162068E+06	0.253232E+04	0.458323[illegible]E+01

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 3.3701 DF = 5, 54

F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 11.0386 DF = 5, 59

F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 92.0815 DF = 1, 59

ALL LINEAR CONS LOT-TO-LOT VLR TENSILE .0002 IN/IN 77 DEG F. MODULUS

TABLE A-19

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
A41	143	0.193989E+04	0.883562E+03	0.402987E+04	142	0.365701E+04	0.260353E+02	0.414230E+00
A42	14	0.319000E+03	0.222199E+03	0.347312E+03	13	0.168046E+03	0.140651E+02	0.716771E+00
A50	14	0.142336E+03	-.154367E+03	0.342937E+03	13	0.176690E+03	0.135915E+02	-.107656E+01
A56	13	0.960359E+03	0.994250E+03	0.100562E+04	12	0.158924E+03	0.882703E+01	0.360107E+00
A57	13	0.934930E+03	0.929812E+03	0.100156E+04	12	0.768394E+02	0.640328E+01	0.394526E+00
A58	13	0.161521E+04	0.861250E+02	0.105123E+03	12	0.100504E+03	0.837534E+01	0.536532E-01
A60	21	0.209300E+04	0.349312E+03	0.382675E+03	20	0.324296F+03	0.162148E+02	0.167696E+00
A64	18	0.656738E+03	0.232375E+03	0.309250E+03	17	0.227028F+03	0.133546E+02	-.353831E+00
WITHIN	249	0.865347E+04	0.294552E+04	0.752856E+04	248	0.652595E+04	0.263143E+02	0.340385E+00
AMONG	7	0.842202E+03	0.620017E+04	0.236844E+04	6	0.190995E+04	0.318332E+03	0.736185E-01
TOTAL	256	0.925737E+05	0.914569E+04	0.989503E+04	255	0.859438E+04	0.352721E+02	0.984744E-01

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 11.4586 DF = 7, 241
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 13.4006 DF = 7, 248
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 38.1014 DF = 1, 248

ANA UNLND CARTONS LOT-TO-LOT VER TENSILE 77 DEG F .0002 IN/MIN, MAXIMUM STRESS

TABLE A-20

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
A41	143	0.193989E+04	0.498779E+00	0.3[illegible]E-01	142	0.3[illegible]E-01	0.257469E-03	0.2571172E-03
M42	14	0.310000E+03	0.180511E-01	0.155240E-02	13	0.155135E-02	0.119335E-03	0.5822950E-04
M50	14	0.143336E+03	0.100372E+00	0.1E7477E-02	13	0.1E0448E-02	0.123422E-03	0.7002591E-03
B3E	13	0.[illegible]E+02	0.111507E+01	0.[illegible]E-02	12	0.2E4822E-02	0.220E85E-03	0.1137406E-02
A37	13	0.934930E+03	0.662369E+00	0.180423E-02	12	0.138496E-02	0.111247E-03	0.7084690E-03
036	13	0.1E0581E+04	-.253769E+00	0.397E23E-02	12	0.393813E-02	0.328178E-03	0.1580903E-03
B46	21	0.208300E+04	0.347783E+01	0.952315E-02	20	0.371649E-02	0.185824E-03	0.1669625E-02
B44	18	0.656738E+03	-.130763E+01	0.368867E-02	17	0.108524E-02	0.638379E-04	-.1991101E-02
WITHIN	249	0.865347E+04	0.431107E+01	0.628270E-01	248	0.6E6793E-01	0.244674E-03	0.4981891E-03
AMONG	7	0.842202E+05	-.923126E+00	0.181798E-01	6	0.1816[illegible]8E-01	0.219496E-02	-.1096087E-04
TOTAL	256	0.9[illegible]E+05	0.330794E+01	0.7E0[illegible]E-01	255	0.758[illegible]3E-01	0.2975821E-03	0.3647599E-04

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 5.4098 DF = 7, 241
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 8.8771 DF = 7, 248
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 8.7779 DF = 1, 248

ANA UNLND CAPTONS LOT-TO-LOT VLR TENSILE 77 DEG F .0002 IN/MIN, STRAIN AT RPTURE

TABLE A-21

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
A41	143	0.193962E+04	0.519006E+04	0.[illegible]128E+06	142	0.794242E+06	0.559326E+04	0.267540E+01
A42	14	0.310005E+03	0.104506E+04	0.323240E+05	13	0.200613E+05	0.221549E+04	0.337096E+01
A43	14	0.143386E+03	-.856625E+03	0.[illegible]875[illegible]E+05	13	0.245555E+05	0.188889E+04	-.597634[illegible]E+01
A[illegible]	13	0.9[illegible]85[illegible]+03	0.[illegible]956[illegible]E+04	0.[illegible]6[illegible]E+05	12	0.[illegible]94945E+05	0.332457E+04	0.301541[illegible]E+01
A37	13	0.934933[illegible]+03	0.546769E+04	0.785160E+05	12	0.463597E+05	0.387631E+04	0.584823[illegible]E+01
A38	13	0.160521[illegible]+04	0.[illegible]22394E+04	0.521770E+05	12	0.[illegible]47026E+05	0.455850[illegible]+04	0.200341[illegible]E+01
A40	21	0.208300E+04	0.376069E+04	0.967453E+05	20	0.899554E+05	0.449777[illegible]+04	-.180541[illegible]E+01
A44	18	0.556736[illegible]+03	-.159375E+02	0.530530E+05	17	0.[illegible]3092[illegible]E+05	0.312309E+04	-.242676[illegible]E-01
WITHIN	249	0.865347[illegible]+04	0.132496E+05	0.120847E+07	248	0.116818E+07	0.479105E+04	0.153112[illegible]E+01
AMONG	7	0.242602E+05	0.250634E+05	0.150[illegible]93E+06	[illegible]	0.142634E+06	0.2577[illegible]4E+05	0.[illegible]975941E+00
TOTAL	25[illegible]	0.928727[illegible]+05	0.383130E+05	0.135[illegible]56E+07	255	0.134275E+07	0.[illegible]2[illegible]570E+04	0.412527[illegible]E+00

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 1.7156 DF = 7, 241
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 4.6090 DF = 7, 248
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 4.2343 DF = 1, 24[illegible]

ARA UNLNL CAPTORS LOT-TO-LOT VER TENSILE 77 DEG F .00[illegible]2 IN/MIN, MODULUS

TABLE A-22

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
005	7	0.187500E+01	-.223437E+01	0.193215E+03	6	0.172600E+03	0.287767E+02	-.332500E+01
006	14	0.218250E+02	-.145875E+02	3.211687E+03	13	0.161462E+03	0.780478E+01	-.791506E+00
010	31	0.789500E+03	0.214937E+03	0.749162E+03	30	0.690547E+03	0.230182E+02	0.272258E+00
012	19	0.349250E+03	0.543812E+03	0.859650E+04	18	0.226145E+04	0.125636E+03	0.144650E+01
013	7	0.151875E+03	-.119992E+03	0.484170E+03	6	0.389268E+03	0.648780E+02	-.790072E+00
014	18	0.717187E+03	0.231937E+03	3.953437E+03	17	0.277425E+03	0.163191E+02	0.323398E+01
015	19	0.256562E+03	0.392875E+03	0.168950E+04	18	0.997027E+03	0.553904E+02	0.166076E+01
016	45	0.125819E+04	0.341937E+03	0.859139E+04	44	0.246299E+04	0.517123E+02	0.269269E+00
017	40	0.189962E+04	-.597125E+03	0.389600E+04	39	0.118621E+04	0.304157E+02	-.351327E+00
018	21	0.105500E+04	-.781875E+03	0.264843E+04	20	0.107543E+04	0.685216E+02	-.694543E+00
019	52	0.121561E+04	0.275125E+03	0.210500E+04	51	0.204274E+04	0.400539E+02	0.226490E+01
020	50	0.284163E+04	0.927250E+03	0.247037E+04	49	0.214450E+04	0.437755E+02	0.351006E+00
021	43	0.289775E+04	0.925312E+03	0.138937E+04	42	0.109358E+04	0.260377E+02	0.319493E+00
022	37	0.203160E+04	0.124794E+04	0.185656E+04	36	0.100377E+04	0.301048E+02	0.614944E+00
023	36	0.269437E+04	0.101462E+04	0.267506E+04	35	0.229298E+04	0.655138E+02	0.376571E+00
024	41	0.196719E+04	0.101062E+04	0.152037E+04	40	0.100118E+04	0.250294E+02	0.513761E+00
025	70	0.546875E+04	0.331681E+04	0.494269E+04	69	0.307528E+04	0.445547E+02	0.584773E+00
026	61	0.523712E+04	0.236681E+04	0.588125E+04	60	0.481162E+04	0.801936E+02	0.451929E+00
027	75	0.763437E+04	0.280719E+04	0.599769E+04	74	0.456547E+04	0.617010E+02	0.367703E+00
028	45	0.659637E+04	0.133106E+04	0.193037E+04	44	0.164531E+04	0.373935E+02	0.209503E+00
029	72	0.836606E+04	0.155237E+04	0.304361E+04	71	0.263465E+04	0.371077E+02	0.220887E+00
030	25	0.202250E+04	0.410687E+03	0.572125E+03	24	0.468731E+03	0.195306E+02	0.203059E+00
031	39	0.192681E+04	-.175000E+03	0.117461E+04	38	0.115893E+04	0.304953E+02	-.907293E-01
032	48	0.575169E+04	-.110481E+04	0.153502E+04	47	0.125973E+04	0.276538E+02	-.202516E+00
033	50	0.446619E+04	0.358812E+03	0.120125E+04	49	0.117242E+04	0.239270E+02	0.303373E-01
034	24	0.149856E+04	0.579187E+03	0.157875E+04	23	0.175290E+04	0.762129E+02	0.366495E+00
035	42	0.108229E+05	-.474250E+03	0.222675E+04	41	0.220608E+04	0.538069E+02	-.435736E-01
036	44	0.605462E+04	0.102325E+04	0.240700E+04	43	0.123467E+04	0.286992E+02	0.169630E+00
037	46	0.190087E+04	0.130125E+03	0.353506E+04	45	0.352619E+04	0.783597E+02	0.681289E-01
WITHIN	1125	0.875769E+05	0.179407E+05	0.997703E+05	1124	0.560953E+05	0.499066E+02	0.204856E+00
AMONG	28	0.971181E+05	0.248229E+04	0.167756E+05	27	0.167102E+05	0.618998E+03	0.000000E+00
TOTAL	1153	0.184695E+06	0.204230E+05	0.765440E+05	1152	0.742857E+05	0.644841E+02	0.000000E+00

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 5.1724 DF = 28, 1096
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 13.0176 DF = 28, 1124
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 72.6430 DF = 1, 1124

ASH-UNLINED CMS (1T-TO-1GT VER TENSILE MAXIMUM STRESS, 0.0002 IN/IN, 77 DEG F

TABLE A-23

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	X (Corrected Sums of Squares and Products)	XY (Corrected Sums of Squares and Products)	Y (Corrected Sums of Squares and Products)	DF (Deviations About Regression)	SS (Deviations About Regression)	MS (Deviations About Regression)	REGRESSION COEFFICIENT
005	7	0.187500E+01	0.437927E-02	0.170459E-02	6	0.169476E-02	0.282460E-03	0.233561E-02
006	14	0.215250E+02	0.355206E-02	0.241190E-02	13	0.241118E-02	0.185475E-03	0.162752E-03
010	31	0.789500E+03	-.419922E+00	0.861130E-02	30	0.639515E-02	0.213172E-03	-.531883E-03
012	19	0.349250E+03	0.108696E+01	0.172905E-01	18	0.139075E-01	0.772637E-03	0.311231E-02
013	7	0.151875E+03	0.519852E+00	0.143362E-01	6	0.125488E-01	0.209146E-02	0.342289E-02
014	18	0.717187E+03	0.596006E-01	0.390117E-02	17	0.389522E-02	0.229130E-03	0.831035E-04
015	19	0.236562E+03	-.793686E+00	0.797904E-02	18	0.531616E-02	0.295342E-03	-.335507E-02
016	45	0.126819E+04	0.133061E+01	0.285864E-01	48	0.271899E-01	0.566455E-03	0.104923E-02
017	40	0.169962E+04	0.240503E+01	0.876108E-02	39	0.536488E-02	0.137561E-03	0.141503E-02
018	23	0.112200E+04	0.678223E+00	0.726544E-02	22	0.685947E-02	0.311794E-03	0.604476E-03
019	52	0.121581E+04	-.112378E+01	0.819206E-02	51	0.715335E-02	0.140262E-03	-.924303E-03
020	50	0.264169E+04	0.145410E+01	0.154915E-01	49	0.146911E-01	0.299818E-03	0.550444E-03
021	43	0.289775E+04	0.921143E+00	0.127853E-01	42	0.124924E-01	0.297439E-03	0.317881E-03
022	37	0.203100E+04	0.705322E+00	0.495332E-02	36	0.470844E-02	0.130790E-03	0.347276E-03
023	36	0.269437E+04	-.188013E+01	0.430123E-01	35	0.417004E-01	0.119144E-02	-.697796E-03
024	41	0.196719E+04	0.468994E+00	0.895691E-02	40	0.884509E-02	0.221127E-03	0.238408E-03
025	70	0.546675E+04	0.303833E+01	0.504556E-01	69	0.487970E-01	0.707202E-03	0.555783E-03
026	61	0.527712E+04	0.996582E+00	0.196037E-01	60	0.194141E-01	0.323568E-03	0.190851E-03
027	75	0.763437E+04	-.469580E+01	0.253582E-01	74	0.224699E-01	0.303647E-03	-.615086E-03
028	45	0.659837E+04	-.355249E+01	0.116854E-01	44	0.977275E-02	0.222108E-03	-.538388E-03
029	72	0.838606E+04	-.232422E+00	0.166492E-01	71	0.166428E-01	0.234406E-03	-.277152E-04
030	25	0.202250E+04	-.170846E+01	0.124721E-01	24	0.110289E-01	0.459536E-03	-.844737E-03
031	39	0.192881E+04	-.424902E+01	0.416331E-01	38	0.332728E-01	0.875600E-03	-.220292E-02
032	48	0.575169E+04	0.142796E+01	0.242424E-01	47	0.238879E-01	0.508253E-03	0.248271E-03
033	50	0.446619E+04	-.221460E+01	0.811958E-02	49	0.702145E-02	0.143295E-03	-.495859E-03
034	24	0.149856E+04	0.134644E+00	0.563543E-02	23	0.562734E-02	0.244667E-03	0.898484E-04
035	42	0.108829E+05	-.122119E+01	0.237436E-01	41	0.236066E-01	0.575771E-03	-.112213E-03
036	44	0.605462E+04	0.278857E+01	0.220175E-01	43	0.207331E-01	0.482166E-03	0.460569E-03
037	46	0.190847E+04	0.167795E+01	0.744829E-02	45	0.597102E-02	0.132689E-03	0.879211E-03
WITHIN	1127	0.876429E+05	-.233352E+01	0.462345E+00	1126	0.462281E+00	0.410552E-03	-.266253E-04
AMONG	28	0.970571E+05	0.419355E+02	0.224206E+00	27	0.206487E+00	0.764766E-02	0.000000E+00
TOTAL	1155	0.184700E+06	0.395820E+02	0.686551E+00	1154	0.678468E+00	0.587927E-03	0.000000E+00

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 3.5992 DF = 28, 1098

F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 18.8063 DF = 28, 1126

F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 0.1539 DF = 1, 1126

ANB UNLND CIRS LOT-TO-LOT VLR TENSILE STN AT RUPTURE, .0002 IN/MIN, 77 DEG F

TABLE A-24

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DEVIATIONS ABOUT REGRESSION DF	SS	MS	REGRESSION COEFFICIENT
008	7	0.167500E+01	-.233750E+02	0.661700E+04	6	0.232559E+04	0.387598E+03	-.1246667E+02
009	14	0.216250E+02	-.180000E+03	0.504700E+05	13	0.487956E+05	0.375351E+04	-.8693642E+01
010	31	0.789500E+03	0.269700E+04	0.610740E+05	30	0.504437E+05	0.168146E+04	0.3669411E+01
012	19	0.349250E+03	0.469262E+04	0.428471E+06	18	0.365419E+06	0.203011E+05	0.1343629E+02
013	7	0.151675E+03	-.157275E+04	0.537300E+05	6	0.374513E+05	0.624188E+04	-.1035554E+02
014	18	0.717187E+03	-.948062E+03	0.939550E+05	17	0.927017E+05	0.545304E+04	-.1321917E+01
015	19	0.236562E+03	0.636362E+04	0.318122E+06	18	0.146938E+06	0.816322E+04	0.2690039E+02
016	49	0.126819E+04	-.142600E+04	0.233365E+06	48	0.231761E+06	0.482836E+04	-.1124439E+01
017	40	0.169962E+04	-.890000E+04	0.175322E+06	39	0.128718E+06	0.330045E+04	-.5236444E+01
018	23	0.112200E+04	-.622131E+04	0.112175E+06	22	0.776768E+05	0.353055E+04	-.5544842E+01
019	52	0.121581E+04	0.752600E+04	0.210523E+06	51	0.163736E+06	0.321052E+04	0.6190059E+01
020	50	0.264169E+04	0.418600E+04	0.194835E+06	49	0.188200E+06	0.384081E+04	0.1584593E+01
021	43	0.269775E+04	0.573400E+04	0.618632E+06	42	0.597465E+06	0.142258E+05	0.1976774E+01
022	37	0.203100E+04	0.831300E+04	0.119933E+06	36	0.859124E+05	0.238646E+04	0.4093056E+01
023	36	0.269437E+04	0.545900E+04	0.122112E+07	35	0.121006E+07	0.345732E+05	0.2026073E+01
024	41	0.196719E+04	0.417800E+04	0.121443E+06	40	0.112567E+06	0.281416E+04	0.2123644E+01
025	70	0.546675E+04	0.222040E+05	0.109109E+07	69	0.106690E+07	0.145158E+05	0.4061644E+01
026	61	0.523712E+04	0.225920E+05	0.648365E+06	60	0.550910E+06	0.918184E+04	0.4313816E+01
027	75	0.763437E+04	0.294250E+05	0.447552E+06	74	0.334117E+06	0.451509E+04	0.3854670E+01
028	45	0.659837E+04	0.258540E+05	0.242217E+06	44	0.140915E+06	0.320261E+04	0.3916237E+01
029	73	0.947969E+04	0.113700E+05	0.387888E+06	72	0.372642E+06	0.517559E+04	0.1340851E+01
030	25	0.202250E+04	0.670256E+04	0.244449E+06	24	0.222237E+06	0.925986E+04	0.3313992E+01
031	39	0.192681E+04	0.430462E+04	0.636900E+05	38	0.540832E+05	0.142324E+04	0.2231749E+01
032	48	0.575169E+04	0.595100E+04	0.170166E+07	47	0.169552E+07	0.360749E+05	0.1034653E+01
033	51	0.473669E+04	0.379600E+04	0.101917E+06	50	0.967748E+05	0.193550E+04	0.6014038E+00
034	24	0.149856E+04	0.449637E+04	0.252003E+06	23	0.236517E+06	0.103703E+05	0.3000459E+01
035	42	0.108839E+05	0.227200E+04	0.366098E+06	41	0.365624E+06	0.891765E+04	0.2087492E+00
036	44	0.605462E+04	0.251700E+04	0.107451E+07	43	0.107347E+07	0.249643E+05	0.4157152E+00
037	46	0.190847E+04	-.244469E+04	0.347392E+06	45	0.144260E+06	0.320579E+04	-.1280968E+01
WITHIN	1129	0.880070E+05	0.169113E+06	0.107745E+08	1126	0.104496E+08	0.926379E+04	0.1921581E+01
AMONG	28	0.969220E+05	-.169961E+06	0.425448E+07	27	0.395644E+07	0.146535E+06	0.0000000E+00
TOTAL	1157	0.184929E+06	-.848000E+03	0.150290E+08	1156	0.150290E+08	0.130009E+05	0.0000000E+00

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 2.4669 DF = 28, 1100
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 17.6549 DF = 28, 1126
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 35.0789 DF = 1, 1128

ADE UNEND CTNS LOT-TO-LOT VLF TENSILE MODULUS, .0002 IN/MIN, 77 DEG F

TABLE A-25

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DEVIATIONS ABOUT REGRESSION DF	SS	MS	REGRESSION COEFFICIENT
684	60	7577.0625	2661.5000	3377.8125	59	2442.9404	41.4058	0.3512574E+00
685	95	10535.9375	4270.5625	7110.5625	94	5395.8379	57.4025	0.4015219E+00
686	97	11237.0625	6898.0625	7940.0625	96	3705.5703	38.5997	0.6138867E+00
724	56	6216.0625	3515.2500	4767.3125	55	2779.4014	50.5346	0.5655107E+00
WITHIN	308	35566.1250	17345.3750	23195.7500	307	14760.2422	48.0780	0.4863262E+00
AMONG	3	5472.5750	-1021.6875	216.2500	2	25.5193	12.7597	0.0000000E+00
TOTAL	311	41139.0000	16323.6875	23412.0000	310	16934.8672	54.6286	0.0000000E+00

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 3.0880 DF = 3, 304
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 15.0769 DF = 3, 307
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 175.4511 DF = 1, 307

ANT UNLINED CARTONS LOT-TO-LOT VLR TENSILE 77 DEG F 0.0002 IN/MIN, MAX STRESS

TABLE A-26

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS x	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
684	60	7577.0625	3.7729	0.0258	59	0.0239	0.0004	0.4979400E-03
685	95	10535.9375	2.8098	0.0443	94	0.0436	0.0005	0.2641800E-03
686	97	11237.0625	2.4412	0.0127	96	0.0122	0.0001	0.2172400E-03
724	56	6216.0625	2.8384	0.0121	55	0.0108	0.0002	0.4566200E-03
WITHIN	308	35566.1250	11.8823	0.0949	307	0.0910	0.0003	0.3325900E-03
AMONG	3	5472.8750	7.0061	0.0129	2	0.0039	0.0020	0.0000000E+00
TOTAL	311	41139.0000	18.8884	0.1078	310	0.0951	0.0003	0.0000000E+00

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 0.5625 DF = 3, 304
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 9.2161 DF = 3, 307
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 13.3167 DF = 1, 307

ANT UNLINED CARTONS LOT-TO-LOT VCR TENSILE 77 DEG F 0.0002 IN/MIN, STN AT RUPT

TABLE A-27

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
684	60	7577.0625	16910.0000	478624.0000	59	441885.3750	7472.6328	0.223173[illegible]E+01
685	95	10635.9375	36207.0000	875568.0000	94	756311.5000	8045.8882	0.340421[illegible]E+01
686	97	11237.0625	69105.0000	984240.0000	96	559262.5000	5825.6504	0.614973[illegible]E+01
724	56	6216.0625	29915.0000	610576.0000	55	466609.1250	8483.8008	0.481253[illegible]E+01
WITHIN	308	35666.1250	152137.0000	2953006.0000	307	2304054.0000	7505.0605	0.426558[illegible]E+01
AMONG	3	5472.8750	-13692.0000	51024.0000	2	16769.4687	8384.7344	0.000000[illegible]E+0[illegible]
TOTAL	311	41139.0000	138445.0000	3004032.0000	310	2536123.0000	8167.4922	0.000000[illegible]E+0[illegible]

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 3.6916 DF = 3, 304

F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 10.3960 DF = 3, 307

F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 86.4688 DF = 1, 307

ANT UNLINED CARTONS LOT-TO-LOT VAR TENSILE 77 DEG F 0.0002 IN/IN, MODULUS

TABLE A-28

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
UNLIKE	165	0.259878E+05	0.265746E+05	0.281520E+05	164	0.281765E+04	0.232786E+02	0.698669E+02
LIKE	50	0.365731E+04	0.454775E+04	0.576370E+05	49	0.310159E+05	0.632977E+03	0.133820E+01
WITHIN	215	0.381449E+05	0.259217E+05	0.219857E+06	214	0.159905E+06	0.938136E+03	0.770004E+00
AMONG	1	0.112700E+03	0.252120E+03	0.757700E+03	1	0.460502E+02	0.000000E+00	0.259021E+01
TOTAL	216	0.419237E+05	0.284346E+05	0.295364E+06	215	0.227827E+06	0.105966E+04	0.128209E+01

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = *09.3782 DF = 1, 213

F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 29.8903 DF = 1, 214

F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 21.0375 DF = 1, 214

ART LYLED VS UNLNE CARTONS HR TRIAX TENSILE 1750 IN/MIN 600 PSI 77 DEG MAX STRES

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PROPELLANT SURVEILLANCE REPORT MINUTEMAN III STAGE III,(U)
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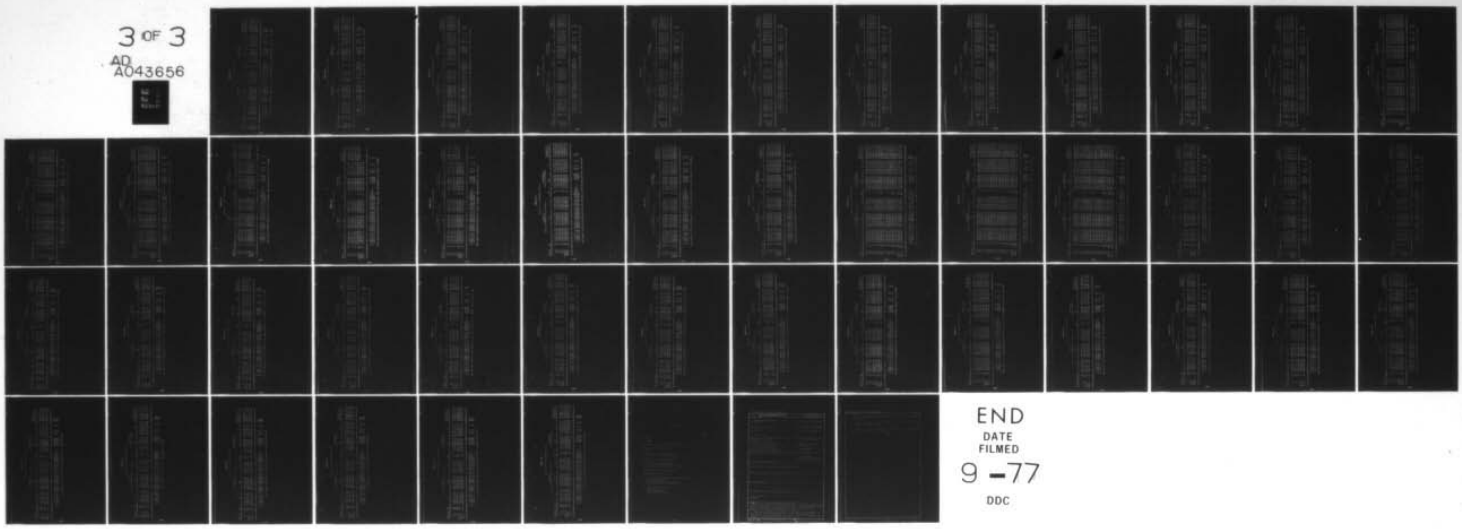

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TABLE A-29

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
[illegible]	165	[illegible]	-.[illegible]E+01	[illegible]	164	[illegible]	[illegible]	[illegible]
LINES	50	0.5[illegible]E+04	-.5971[illegible]E+01	[illegible]	49	0.2244[illegible]E-01	0.457[illegible]E-03	-.1[illegible]E-02
WITHIN	215	0.[illegible]E+05	-.1219[illegible]E+02	[illegible]	214	[illegible]	0.[illegible]E-03	-.[illegible]E-04
ANGLE	1	[illegible]	-.[illegible]E+00	[illegible]	0	0.[illegible]E-06	0.[illegible]E+00	0.[illegible]E+00
TOTAL	216	0.4442[illegible]	-.1[illegible]E+02	[illegible]	215	[illegible]	0.[illegible]E-03	0.[illegible]E+00

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 7.9243 DF = 1. 214

F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 0.9368 DF = 1. 214

F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 5.3240 DF = 1. 214

ART LINER VS UNLINED CARTONS FOR INITIAL TENSILE, 1750 IN/MIN, 600 PSI, STR AT RUPT

TABLE A-30

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
WITHIN	165	0.284876E+05	-.655126E+06	0.[illegible]05E+09	164	0.143E09E+09	0.[illegible]65E+06	-.8795751E+01
LINES	50	0.36[illegible]E+04	-.466550E+05	0.[illegible]35E+06	49	0.179E79E+08	0.[illegible]10E+06	-.1321371E+02
WITHIN	215	0.331445E+05	-.361375E+06	0.[illegible]25E+09	214	0.1[illegible]61E+09	0.75[illegible]26E+06	-.3291771E+01
AMONG	1	0.11[illegible]E+05	0.46[illegible]51E+06	0.[illegible]E+08	1	0.[illegible]E+08	0.[illegible]E+08	0.[illegible]E+02
TOTAL	216	0.444237E+05	0.[illegible]25761E+06	0.[illegible]73E+09	215	0.1[illegible]36E+09	0.[illegible]21E+06	0.[illegible]E+01

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 0.0044 DF = 1. 213
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 26.0442 DF = 1. 214
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 3.7681 DF = 1. 214

ART LINED VS [illegible] CARTONS HF TRIAX TENSILE 1750 LB/IN 600 PSI 77 DEG MODULUS

TABLE A-31

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS x	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
ANE	45	0.276896E+04	0.422087E+04	0.657310E+05	44	0.552969E+05	0.130766E+04	0.152435E+01
ANT	50	0.369730E+04	0.494775E+04	0.376770E+05	49	0.710159E+05	0.632977E+03	0.133807E+01
WITHIN	95	0.646625E+04	0.916862E+04	0.103366E+06	94	0.906876E+05	0.961358E+03	0.141791E+01
AMONG	1	0.792121E+03	0.102566E+04	0.442603E+04	1	-0.224563E+01	0.000000E+00	-0.230182E+01
TOTAL	96	0.725837E+04	0.734301E+04	0.107968E+06	95	0.100014E+06	0.105411E+04	0.101151E+01

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 0.0565 DF = 1. 95
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 10.1656 DF = 1. 94
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 13.5229 DF = 1. 94

ANE VS ANT LINED CARTONS HR TRIAX TENSILE 1750 IN/MIN 600 PSI 77 DEG MAX STRESS

TABLE A-32

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
ANB	45	0.275896E+04	0.14235eE+01	0.109529E-01	44	0.10?210E-01	0.232c97E-03	-.5141227E-0?
ALT	50	0.3E?730E+04	-.597166E+01	0.32[illegible]64E-01	49	0.2?4412E-01	0.457964E-03	-.1615147E-0?
WITHIN	95	0.649625E+04	-.739526E+01	0.436393E-01	94	0.345?1EE-01	0.367o69E-03	-.1143677E-0?
AMONG	1	0.79?1c1E+03	0.[illegible]037E+00	0.772?7oE-04	1	0.5eee24E-05	0.0[illegible]EE+00	0.3001?6?E-03
TOTAL	9e	0.7259371+04	-.715723E+01	0.4311E8E-01	95	0.3[illegible]0F01E-01	0.379575E-03	-.985928?E-03

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 5.4649 DF = 1, 9e
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 4.0168 DF = 1, 94
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 22.9899 DF = 1, 94

ANB VS ALT LINED CAPTIONS PR TRIAX TENSILE 1750 IN/MIN 600 PSI 77 DEG STN AT RUPT

TABLE A-33

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
ARE	45	0.276859E+04	0.510200E+04	0.955750E+07	44	0.954708E+07	0.216997E+06	0.186424[illegible]E+01
ART	50	0.3E973[illegible]E+04	0.4[illegible]855[illegible]E+05	0.[illegible]E+08	49	0.179[illegible]79E+08	0.367100E+06	-.1321371E+02
WITHIN	95	0.546625E+04	-.438930E+05	0.[illegible]E+08	94	0.27[illegible]957E+08	0.296763E+06	-.675706[illegible]E+01
AMONG	1	0.79[illegible]E+03	0.4195[illegible]E+05	0.[illegible]E+07	0	0.327000E+03	0.000000E+00	0.526935[illegible]E+02
TOTAL	96	0.725537E+04	-.174200E+04	0.[illegible]E+08	95	0.3[illegible]098E+08	0.[illegible]20103E+06	-.239965[illegible]E+00

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 1.2157 DF = 1, 93
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 8.4717 DF = 1, 94
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 0.9949 DF = 1, 94

ARB VS ART LTHEC CARTONS HR TRIAX TENSILE 1750 IN/MIN 600 PST 77 DEG MODULUS

TABLE A-34

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
ANA	65	0.261765E+05	0.204900E+04	0.772560E+05	64	0.771470E+05	0.120542E+04	-.771470E-01
ANB	214	0.504051E+05	0.261623E+05	0.565120E+06	213	0.349509E+06	0.164089E+04	0.5543141E+00
WITHIN	279	0.766636E+05	0.281130E+05	0.442410E+06	278	0.433783E+06	0.156027E+04	0.3306129E+00
AMONG	1	0.143714E+04	0.100400E+04	0.736000E+03	0	0.345886E+02	0.000000E+00	0.5986178E+01
TOTAL	280	0.804207E+05	0.271170E+05	0.443152E+06	279	0.434080E+06	0.155559E+04	0.3371491E+00

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 4.6286 DF = 1, 277
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 0.1447 DF = 1, 278
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 5.5329 DF = 1, 278

ANA VS ANB UNLTD CTLS HR TRIAX TENSILE 1750 IN/MIN 77 DEG F 600 PST MAX STRESS

TABLE A-35

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
ANA	65	0.2b1785E+05	0.52077bE+01	0.2b773b2E+03	64	0.2b7781E+03	0.418408E+01	0.1646133E-03
ANB	214	0.50[illegible]51E+05	0.7247b0E+01	0.617[illegible]eE+00	213	0.216032E+00	0.1014[illegible]3E-02	0.142[illegible]E-07
WITHIN	279	0.7e9E36E+05	0.12455cE+02	0.243c44E+00	27c	0.241E30E+00	0.A76071E-03	0.157[illegible]E-03
AMONG	1	0.143712E+04	-.977148E+01	0.[illegible]7E-01	0	0.191927E-04	0.000000E+00	-.679932E-02
TOTAL	28C	0.8042b7E+05	0.26040bE+01	0.3102b3E+00	279	0.3102[illegible]3E+00	0.111187E-02	0.3337549E-04

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 76.7500 DF = 1, 277
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 78.5376 DF = 1, 27c
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 2.2575 DF = 1, 278

ANA VS ANB UNLND CTDS HR TRIAX TENSILE 1750 IN/MIN 77 DEG F 600 PSI SIN AT RUPT

TABLE A-36

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
ANA	65	0.281785E+05	-.775985E+06	0.429150E+08	64	0.215466E+08	0.336666E+06	-.2753819E+02
ANB	214	0.505051E+05	-.814401E+06	0.511765E+09	213	0.493182E+09	0.233885E+07	-.1610666E+02
WITHIN	279	0.786983E+05	-.159342E+07	0.554281E+09	278	0.528209E+09	0.187864E+07	-.2018626E+02
ANGLE	1	0.147712E+04	0.290512E+06	0.587144E+08	0	-.913607E+03	0.000000E+00	0.2021467E+03
TOTAL	280	0.804207E+05	-.130387E+07	0.613607E+09	279	0.591867E+09	0.212139E+07	-.1621312E+02

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 1.2620 DF = 1, 277
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 37.1510 DF = 1, 278
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 17.1373 DF = 1, 278

ANA VS ANB UNLAB CTNS HK TRIAX TENSILE 1750 IN/MIN 77 DEG F 600 PSI MODULUS

TABLE A-37

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
ANA	65	0.281765E+05	-.204900E+04	0.773120E+05	64	0.771630E+05	0.120567E+04	-.727149E-01
ANB	214	0.508051E+05	0.2c215OE+05	0.366356E+06	213	0.350c66E+06	0.164c32E+04	0.5553572E+00
ANT	165	0.294476E+05	0.205690E+05	0.181872E+06	164	0.167505E+06	0.102137E+04	0.6984942E+00
WITHIN	444	0.1c8431E+06	0.487350E+05	0.625520E+06	443	0.605376E+06	0.136654E+04	0.4310104E+00
AMONG	2	0.354275E+04	-.128790E+05	0.922880E+05	1	0.454686E+05	0.454686E+05	-.3635311E+01
TOTAL	446	0.111974E+05	0.338560E+05	0.717508E+06	445	0.651442E+06	0.138302E+04	0.3023559E+00

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 3.7195 DF = 2, 441
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 3.6629 DF = 2, 443
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 14.7404 DF = 1, 443

ANA VS ANBIANT UNLNO CARTONS MR TRIAX TENSILE 1750 IN/MIN 600 PSI MAXIMUM STRESS

TABLE A-38

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
ANA	65	0.261765E+05	0.520776E+01	0.267792E-01	64	0.258167E-01	0.403366E-03	0.184813[illegible]E-03
ANB	214	0.568051E+05	0.724707E+01	0.217068E+00	213	0.216034E+00	0.101424E-02	0.142644[illegible]E-03
ANT	165	0.294476E+05	-.622949E+01	0.152[illegible]29E+00	164	0.151511E+00	0.923849E-03	-.211544[illegible]E-03
WITHIN	444	0.109431E+06	0.622534E+01	0.[illegible]7[illegible]E+00	443	0.396319E+00	0.894624E-03	0.574127[illegible]E-04
AMONG	2	0.354275E+04	-.198191E+02	0.114402E+00	1	0.352854E-02	0.352854E-02	-.559426[illegible]E-02
TOTAL	446	0.111974E+06	-.135937E+02	0.509[illegible]28E+00	445	0.507777E+00	0.114107E-02	-.121400[illegible]E-03

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 1.6573 DF = 2, 44[illegible]

F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = [illegible]2.2935 DF = 2, 44[illegible]

F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 0.3995 DF = 1, 445

ANA VS ANB&ANT UNLND CTNS HR TRIAX TENSILE 1750 IN/MIN 600 PSI 77 DEG ST[illegible] AT RUP

TABLE A-39

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
ANA	65	0.281785E+05	-.775985E+06	0.429158E+08	64	0.215460E+08	0.336656E+06	-.2753819E+02
ANB	214	0.508051E+05	-.813460E+06	0.511304E+09	213	0.498118E+09	0.233858E+07	-.1611018E+02
ANT	165	0.284476E+05	-.259206E+06	0.145889E+09	164	0.143607E+09	0.875652E+06	-.8802067E+01
WITHIN	444	0.1[illegible]E+06	-.18536EE+07	0.7[illegible]E+09	442	0.[illegible]3219E+09	0.[illegible]E+06	-.1709526E+02
AMONG	2	0.354275E+04	0.630017E+06	0.1134[illegible]E+09	1	0.144282E+07	0.144282E+07	0.1778328E+03
TOTAL	446	0.111974E+06	-.122365E+07	0.813588E+09	445	0.800216E+09	0.179824E+07	-.1092796E+02

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 93.1016 DF = 2, 442
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 241.0244 DF = 2, 443
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 366.3237 DF = 1, 443

ANA VS ANB&ANT UNLND CARTONS HR TRIAX TENSILE 1750 IN/MIN 600 PSI MODULUS

TABLE A-40

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS x	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
051	3	0.100000E+01	-.031250E+01	0.371100E+03	2	0.301902E+03	0.150951E+03	-.031250[illegible]E+01
055	3	0.400000E+01	0.555625E+02	[illegible].176400E+04	2	[illegible].992202E+03	0.496101E+03	0.138906[illegible]E+02
056	3	0.400000E+01	0.116875E+02	[illegible].116900E+04	2	[illegible].113077E+04	0.565386E+03	0.270312[illegible]E+01
057	3	0.100000E+01	-.403006E+02	[illegible].270100E+04	2	[illegible].113430E+04	0.567146E+03	-.408007[illegible]E+02
058	3	0.900000E+01	0.547656E+02	[illegible].212200E+04	2	[illegible].178851E+04	0.894255E+03	0.608723[illegible]E+01
060	3	0.100000E+01	0.205977E+02	[illegible].139900E+04	2	[illegible].974737E+03	0.487368E+03	0.205976[illegible]E+02
061	3	0.100000E+01	-.499609E+02	0.373900E+04	2	[illegible].124291E+04	0.621453E+03	-.499609[illegible]E+02
WITHIN	21	0.210000E+02	0.426836E+02	[illegible].133540E+05	20	[illegible].132672E+05	0.663362E+03	0.203[illegible]552E+01
AMONG	6	0.162486E+04	0.444188E+04	[illegible].331290E+05	5	[illegible].215862E+05	0.419725E+04	0.000000[illegible]E+00
TOTAL	27	0.164586E+04	0.488456E+04	0.464830E+05	26	[illegible].342637E+05	0.131783E+04	0.000000[illegible]E+00

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 1.7586 DF = 6, 14
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 5.2753 DF = 6, 20
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 0.1308 DF = 1, 20

AND LINED CYLS LOT-TO-LOT HR TRIAX TEXS MAXIMUM STRESS, 1750 JN/MIN, 600 PSI

TABLE A-41

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
051	3	0.10[illegible]+01	-.2[illegible]E-01	0.9[illegible]E-03	2	0.4[illegible]E-05	0.2[illegible]E-05	-.2[illegible]E-01
[illegible]	3	0.4[illegible]+01	-.5[illegible]E-01	0.[illegible]E-03	2	0.[illegible]E-04	0.1[illegible]E-04	-.1[illegible]E-01
[illegible]	3	0.4[illegible]+01	0.[illegible]E-02	0.[illegible]E-04	2	0.[illegible]E-04	0.1[illegible]E-04	0.[illegible]E-01
[illegible]	3	0.10[illegible]+01	0.[illegible]E-02	0.[illegible]E-03	2	0.[illegible]E-03	0.2[illegible]E-03	0.[illegible]E-02
058	3	0.9000000E+01	-.1243[illegible]E-01	0.[illegible]E-03	2	0.[illegible]E-03	0.2[illegible]E-03	-.1[illegible]E-01
[illegible]	3	0.1000000E+01	-.9246[illegible]E-02	0.[illegible]E-03	2	0.[illegible]E-04	0.1[illegible]E-04	-.9[illegible]E-02
061	3	0.10[illegible]+01	0.2[illegible]E-01	0.[illegible]E-02	2	0.[illegible]E-03	0.2[illegible]E-03	0.[illegible]E-01
WITHIN	21	0.2100000E+02	-.6254588E-01	0.372[illegible]E-02	20	0.353996E-02	0.176[illegible]E-03	-.2[illegible]E-02
AMONG	6	0.1[illegible]E+04	-.6[illegible]E+00	0.[illegible]E-02	5	0.[illegible]E-02	0.2[illegible]E-03	0.[illegible]E+00
TOTAL	27	0.1[illegible]E+04	-.[illegible]E+00	0.[illegible]E-02	26	0.[illegible]E-02	0.1[illegible]E-03	0.[illegible]E+00

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 2.5838 DF = 6, 18
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 1.1141 DF = 5, 20
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 1.0525 DF = 1, 20

AND LIFED CARTONS LOT TO LOT HP TRIAX TENS ST[illegible] AT FLP, 1750 IN/MIN, 600 PSI

TABLE A-42

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
[illegible]	3	[illegible]	0.369000E+03	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	3	[illegible]	-.296500E+03	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	3	[illegible]	-.696000E+03	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
WITHIN	21	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
AMONG	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
TOTAL	27	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 1.9958 DF = 6, 14
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 3.8215 DF = 6, 20
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 5.2060 DF = 1, 20

AND LINED CARTONS LOT-TO-LOT FOR TMAX TENS MODULUS, 1750 IN/MIN, 400 PSI

TABLE A-43

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
711	9	0.242500E+03	0.520187E+03	0.272700E+04	8	0.157256E+04	0.196570E+03	0.217
712	9	0.120102E+03	0.413625E+03	0.1[illegible]E+04	8	[illegible]	[illegible]	[illegible]
713	9	0.157602E+03	0.[illegible]E+03	0.[illegible]E+04	8	[illegible]	[illegible]	[illegible]
819	5	0.600000E+01	0.[illegible]E+03	0.[illegible]E+04	4	[illegible]	[illegible]	[illegible]
820	5	0.150000E+01	-.42140[illegible]E+02	0.[illegible]E+04	4	[illegible]	[illegible]	-.[illegible]
821	5	0.150000E+01	0.[illegible]E+01	0.[illegible]E+03	4	0.[illegible]E+03	0.[illegible]E+02	0.[illegible]
WITHIN	42	0.529203E+03	0.139033E+04	0.[illegible]E+05	41	0.[illegible]E+05	0.[illegible]E+03	0.[illegible]
AMONG	5	0.285680E+04	0.270861E+04	0.[illegible]E+05	4	0.[illegible]E+04	0.192397E+04	
TOTAL	47	0.339600E+04	0.409894E+04	0.[illegible]E+05	45	[illegible]	[illegible]	

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 1.5910 DF = 5, 36
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 3.5498 DF = 5, 41
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 7.2399 DF = 1, 41

ANT LINED CARTONS LOT-TO-LOT HR TRIAX TENSILE 1750 IN/MIN 600 PSI. MAX STRESS

TABLE A-44

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
711	9	0.242500E+03	-.130127E+00	0.416720E-02	8	0.409757E-02	0.512171E-03	-.536605E-01
712	9	0.121012E+03	-.457367E+00	0.445611E-02	8	0.274227E-02	0.342784E-03	-.380431E-01
713	9	0.157602E+03	-.292995E+00	0.387770E-02	8	0.326304E-02	0.407880E-03	-.185931E-01
819	5	0.600000E+01	-.345917E-01	0.267576E-02	4	0.247683E-02	0.619208E-03	-.576544E-01
820	5	0.150000E+01	0.374908E-01	0.135279E-02	4	0.415745E-03	0.103936E-03	0.249939E-01
821	5	0.150000E+01	0.542906E-01	0.303543E-02	4	0.107049E-02	0.267623E-03	0.361938E-01
WITHIN	42	0.529203E+03	-.823305E+00	0.195523E-01	41	0.182714E-01	0.445645E-03	-.155574IE-01
AMONG	5	0.265660E+04	-.435077E+01	0.103157E-01	4	0.369268E-02	0.923170E-03	
TOTAL	47	0.338600E+04	-.517407E+01	0.298710E-01	46	0.219646E-01	0.477491E-03	

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 2.1332 DF = 5, 36
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 1.6574 DF = 5, 41
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 2.8741 DF = 1, 41

ANT LINED CARTONS LOT-TO-LOT HR TRT/X TENSILE 1750 IN/MIN 600 PSI STRAIN AT RUPT

TABLE A-45

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
711	9	0.242500E+03	-.233340E+05	0.305730E+07	8	0.910837E+06	0.101205E+06	-.962.2664E+01
712	9	0.120102E+03	-.205600E+05	0.563731E+07	8	0.211966E+07	0.264958E+06	-.171[illegible]E+03
713	9	0.157602E+03	-.410550E+04	0.282[illegible]E+07	8	0.271[illegible]E+07	0.338781E+06	-.[illegible]E+02
819	5	0.600000E+01	-.910000E+03	0.171794E+07	4	0.157592E+07	0.394098E+06	-.151[illegible]E+03
820	5	0.150000E+01	-.821500E+03	0.865[illegible]E+06	4	0.356420E+06	0.[illegible]E+05	-.[illegible]E+03
821	5	0.150000E+01	-.235000E+03	0.640160E+06	4	0.602397E+06	0.150599E+06	-.158[illegible]E+03
WITHIN	42	0.529203E+03	-.500285E+05	0.146782E+08	41	0.994872E+07	0.242652E+06	-.945355[illegible]E+02
AMONG	5	0.285660E+04	-.214635E+05	0.224597E+07	4	0.[illegible]E+07	0.521159E+06	
TOTAL	47	0.338860E+04	-.714970E+05	0.169[illegible]E+08	46	0.154145E+08	0.335[illegible]E+06	

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 1.5595 DF = 5. 36
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 4.5050 DF = 5. 41
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 19.4908 DF = 1. 41

ANT LINED CARTONS LOT-TO-LOT HR TRIAX TENSILE 1750 IN/MIN 600 PSI MODULUS

TABLE A-46

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
M41	19	0.257000E+05	0.121250E+04	0.326150E+05	18	0.268945E+05	0.149414E+04	0.4717897E+01
015	2	0.240000E+02	0.273125E+02	0.311250E+02	1	0.428085E-01	0.428085E-01	0.1138021E+01
037	8	0.200000E+01	0.427500E+02	0.122400E+04	7	0.310219E+03	0.443170E+02	0.2137500E+02
040	8	0.800000E+01	0.294375E+03	0.146450E+05	7	0.381292E+04	0.544703E+03	0.3679687E+02
044	8	0.600000E+01	-.346875E+02	0.398000E+03	7	0.197463E+03	0.282090E+02	-.5781250E+01
WITHIN	45	0.297000E+03	0.154225E+04	0.489131E+05	44	0.409046E+05	0.929649E+03	0.5192760E+01
AMONG	4	0.205926E+05	-.999925E+04	0.196219E+05	3	0.147665E+05	0.492216E+04	-.4855742E+00
TOTAL	49	0.208896E+05	-.845700E+04	0.685350E+05	48	0.651112E+05	0.135648E+04	-.4048420E+00

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 3.1041 DF = 4. 40
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 6.5096 DF = 4. 44
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 8.6146 DF = 1. 44

ANA UNLND CARTONS LOT-TO-LOT HR TRIAX TENSILE 1750 IN/MIN 600 PSI. MAX STRESS

TABLE A-47

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
[illegible]	19	0.257[illegible]E+03	-.375443E+00	0.9[illegible]955E-02	18	0.93[illegible]07E-02	0.5167[illegible]E-03	-.1460[illegible]6E-02
[illegible]15	2	0.240000E+02	0.299655E-01	0.374913E-04	1	0.3[illegible]5[illegible]9E-07	0.[illegible]250[illegible]E-07	0.1249[illegible]7E-02
[illegible]37	8	0.200000E+01	0.43+570E-01	0.166[illegible]16E-02	7	0.7199[illegible]5E-03	0.1028441-03	0.217[illegible]5[illegible]E-01
[illegible]4[illegible]	[illegible]	[illegible].30[illegible]000E+[illegible]	-.[illegible]+[illegible]5[illegible]E-[illegible]	[illegible].3[illegible]7.41[illegible]-02	7	[illegible].[illegible]2[illegible]9[illegible]E-03	[illegible].116157 -03	-.75[illegible]7[illegible]E-02
[illegible]44	8	0.600000E+01	0.276794E-01	0.432909E-03	7	0.3[illegible]5217E-03	0.4360241-04	0.4612234E-02
WITHIN	45	0.297000E+03	-.324506E+00	0.132545E-01	44	0.128771E-01	0.292661E-03	-.1127591E-02
AMONG	4	0.205926E+05	0.486240E+01	0.652468E-02	3	0.537656E-02	0.1792191-02	0.23[illegible]232E-03
TOTAL	49	0.208896E+05	0.452759E+01	0.197792E-01	48	0.1[illegible]7979E-01	0.391623E-03	0.21673[illegible]E-03

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 1.5400 DF = 4. 46
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 5.0577 DF = 4. 44
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 1.2896 DF = 1. 44

ANA UNLNE CARTONS LOT-TO-LOT [illegible]R TRI[illegible]X TENSILE 1750 IN/MIN 600 PSI. STR AT RPTURE

TABLE A-48

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
M41	19	0.257000E+03	0.135000E+05	0.612966E+07	18	0.542052E+07	0.301140E+06	0.525291E+02
015	2	0.240000E+02	-.400000E+04	0.666688E+06	1	0.215000E+02	0.215000E+02	-.166666E+03
037	8	0.200000E+01	-.217000E+03	0.157056E+06	7	0.133511E+06	0.190731E+05	-.108500E+03
040	8	0.800000E+01	-.266000E+03	0.101456E+07	7	0.100992E+07	0.144274E+06	-.335000E+02
044	6	0.600000E+01	-.136000E+04	0.473200E+06	7	0.294397E+06	0.420568E+05	-.172000E+03
WITHIN	45	0.297000E+03	0.795900E+04	0.844556E+07	44	0.837122E+07	0.167073E+06	0.268853E+01
AMONG	4	0.205926E+05	-.710536E+06	0.313714E+08	5	0.685518E+07	0.228506E+07	-.345040E+02
TOTAL	49	0.208896E+05	-.702551E+06	0.398170E+08	48	0.161891E+08	0.337272E+06	-.356315E+02

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 2.0017 DF = 4, 46
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 10.6347 DF = 4, 44
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 1.1459 DF = 1, 44

ANA UNLND CARTONS LOT-TO-LOT MR TRTAX TENSILE 1750 IN/MIN 600 PSI. MODULUS

TABLE A-49

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
016	5	0.520000E+02	-.660000E+03	0.918[illegible]E+04	4	0.811078E+03	0.202770E+03	-.126923E+02
019	6	0.788594E+02	-.525000E+03	[illegible]E+04	5	0.291391E+04	0.582781E+03	-.683[illegible]E+01
021	5	0.217336E+03	0.360000E+03	[illegible]E+04	4	0.152359E+04	0.380898E+03	0.174844E+01
023	7	0.346000E+03	0.672500E+03	[illegible]E+04	6	0.116590E+04	0.277550E+03	0.194[illegible]E+01
025	7	0.537500E+03	0.100000E+03	0.3[illegible]E+04	6	0.3[illegible]139E+04	0.[illegible]32E+03	0.1[illegible]
028	7	0.390000E+03	-.637500E+02	0.471[illegible]E+04	6	0.470[illegible]E+04	0.783430E+03	-.163[illegible]
028	5	0.625336E+03	-.938875E+03	0.532[illegible]E+04	4	0.391838E+04	0.979595E+03	-.150139[illegible]
031	5	0.228000E+03	-.106825E+04	0.[illegible]22700E+04	4	0.122192E+04	0.305480E+03	-.468530[illegible]
035	13	0.489921E+04	-.117687E+04	0.261310E+05	12	0.258483E+05	0.215402E+04	-.240217[illegible]
036	4	0.249203E+03	0.117300E+04	0.5[illegible]E+04	3	0.133[illegible]E+03	0.445618E+02	0.470[illegible]
041	9	0.135760E+04	0.102294E+04	0.311360E+04	8	0.234223E+04	0.292778E+03	0.753[illegible]
042	6	0.538223E+03	0.113944E+04	0.349400E+04	7	0.108177E+04	0.154538E+03	0.211[illegible]
045	9	0.256240E+04	0.311844E+04	0.468700E+04	8	0.109167E+04	0.136458E+03	0.121[illegible]
047	9	0.182000E+04	0.582250E+03	0.302900E+04	8	0.284273E+04	0.355341E+03	0.[illegible]
048	12	0.952309E+03	-.155269E+04	0.900500E+04	11	0.647343E+04	0.588493E+03	-.163[illegible]
049	11	0.306000E+04	0.314262E+04	0.546[illegible]E+04	10	0.225348E+04	0.225348E+03	0.102[illegible]
050	7	0.154000E+04	0.162666E+04	0.311[illegible]E+04	6	0.139138E+04	0.231900E+03	0.105[illegible]
WITHIN	131	0.194720E+05	0.697237E+04	0.[illegible]E+06	130	0.[illegible]E+06	0.795403E+03	0.358[illegible]
AMONG	18	0.159825E+05	0.885462E+04	0.122[illegible]E+06	17	0.117932E+06	0.693720E+04	0.000000[illegible]
TOTAL	149	0.353544E+05	0.15[illegible]E+05	0.[illegible]E+06	148	0.221[illegible]E+06	0.149[illegible]E+04	0.000000[illegible]

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 3.8550 DF = 18, 112
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = [illegible].2614 DF = 18, 130
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 3.1388 DF = 1, 130

ALL UNLND CTNS LOT-TO-LOT HR TRIAX TENSILE 77 DEG 175C 10/MIN 600 PSI MAX STRESS

TABLE A-50

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
016	5	0.520000E+02	0.101074E+00	0.204749E-02	4	0.269103E-02	0.662758E-03	0.194373E-02
019	6	0.768594E+02	-.685898E+00	0.624173E-02	5	0.272773E-02	0.545547E-03	-.892416E-02
021	5	0.217336E+03	0.399002E+00	0.157331E-02	4	0.839792E-03	0.209948E-03	0.183587E-02
027	7	0.341000E+03	0.291107E+00	0.262496E-02	6	0.153854E-02	0.256590E-03	0.841050E-01
025	7	0.537500E+03	0.176634E+01	0.869999E-02	6	0.268641E-02	0.481068E-03	0.328621E-02
026	7	0.390000E+03	0.728500E+00	0.917500E-02	6	0.701587E-02	0.130264E-02	0.186794E-02
028	5	0.625336E+03	0.785980E-01	0.264663E-02	4	0.263675E-02	0.659186E-03	0.125689E-03
029	1	0.000000E+00	0.000000E+00	0.140452E-02	0	0.140452E-02	0.000000E+00	0.000000E+00
030	1	0.000000E+00	0.000000E+00	0.391960E-03	0	0.391960E-03	0.000000E+00	0.000000E+00
031	5	0.225000E+03	-.544861E+00	0.195503E-02	4	0.653016E-03	0.163254E-03	-.238974E-02
035	13	0.489921E+04	0.610681E+01	0.222352E-01	12	0.148241E-01	0.123534E-02	0.124643E-02
036	4	0.249203E+03	0.776489E+00	0.263202E-02	3	0.212568E-03	0.708560E-04	0.311588E-02
041	9	0.139760E+04	-.121471E+01	0.384409E-02	8	0.275723E-02	0.344654E-03	-.894744E-03
042	8	0.538223E+03	0.210390E+01	0.897902E-02	7	0.754952E-03	0.107850E-03	0.380698E-02
045	9	0.256240E+04	0.334778E+01	0.980912E-02	8	0.493125E-02	0.616406E-03	0.130650E-02
047	5	0.182000E+04	0.239757E+01	0.463367E-02	4	0.150524E-02	0.188155E-03	0.131734E-02
048	12	0.952309E+03	-.352417E+00	0.313759E-01	11	0.102455E-01	0.931405E-03	-.370065E-02
049	11	0.308000E+04	0.370839E+01	0.812194E-02	10	0.256558E-02	0.256558E-03	0.120272E-02
050	7	0.154000E+04	0.137057E+01	0.171682E-02	6	0.499030E-03	0.831717E-04	0.889837E-03
WITHIN	131	0.194726E+05	0.203743E+02	0.110936E+00	130	0.892201E-01	0.686308E-03	0.104633E-02
AMONG	18	0.158825E+05	-.111421E+02	0.320516E-01	17	0.242351E-01	0.142559E-02	0.000000E+00
TOTAL	149	0.353544E+05	0.923218E+01	0.142590E+00	148	0.140579E+00	0.949860E-03	0.000000E+00

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 2.7020 DF = 18, 112
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 4.1066 DF = 18, 130
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 30.9237 DF = 1, 130

ANE UNLNG CTNS LOT-TO-LOT HR TRIAX TENSILE 77 DEG 1750 IN/MIN 600 PSI STR AT RUP

TABLE A-51

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
01[illegible]	5	0.520000E+02	-.100000E+05	0.347315E+07	4	0.156008E+07	0.387519E+06	-.1926077E+02
019	6	0.7[illegible]594E+02	0.134300E+04	0.511[illegible]93E+07	5	0.509[illegible]4[illegible]E+07	0.101[illegible]69E+07	0.1747346E+02
021	5	0.217336E+03	-.349330E+05	0.[illegible]7334E+07	4	0.1[illegible]847E+07	0.264617[illegible]+06	-.1607227E+03
023	7	[illegible].[illegible]+03	-.42[illegible]E+05	[illegible].[illegible]9E+07	[illegible]	0.[illegible]9E2E+07	0.[illegible]8270[illegible]+06	-.1231214E+03
025	7	0.537500E+03	-.570001E+05	0.752000E+07	6	0.1475[illegible]5E+07	0.245892[illegible]+06	-.1060465E+03
02[illegible]	7	0.[illegible]90000E+03	-.112500E+05	0.93[illegible]08E+07	6	0.90[illegible]43EE+07	0.150[illegible]39[illegible]+07	-.2884615E+02
028	5	0.625336E+03	-.291000E+05	0.[illegible]98[illegible]0E+07	4	0.1[illegible]25[illegible]3E+07	0.40[illegible]458E+06	-.4655497E+02
029	1	0.000000E+00	0.000000E+00	0.720000E+06	0	0.720000E+06	0.000000E+00	0.0000000E+00
030	1	0.000000E+00	0.000000E+00	0.405008E+06	0	0.405008E+06	0.000000E+00	0.0000000E+01
031	5	0.228000[illegible]+03	0.156600[illegible]+04	0.337722E+07	4	0.326[illegible]18E+07	0.[illegible]41546[illegible]+06	0.695[illegible]139[illegible]+01
035	13	0.48[illegible]921[illegible]+04	-.339638E+06	0.[illegible]05[illegible]08E+08	12	0.[illegible]9[illegible]642E+07	0.582[illegible]62[illegible]+06	-.6933517[illegible]+02
036	4	0.249203[illegible]+05	0.444400E+04	0.[illegible]68[illegible]11E+07	3	0.26[illegible]132E+07	0.393773[illegible]+06	0.1783280E+02
041	9	0.135760[illegible]+04	0.379350E+05	0.754[illegible]48E+07	8	0.648[illegible]47E+07	0.[illegible]10059[illegible]+06	0.2794266E+02
042	6	0.538[illegible]23[illegible]+03	-.412710E+05	0.[illegible]50[illegible]17E+07	7	0.340502E+06	0.486431[illegible]+05	-.7668015E+02
045	9	0.25[illegible]240E+04	-.279349E+06	[illegible].343168E+08	8	0.3[illegible]6[illegible]03E+07	0.482829[illegible]+06	-.1090184E+03
047	9	0.162000E+04	-.225996E+06	0.[illegible]92032E+08	8	0.114251E+07	0.142814[illegible]+06	-.1241736E+03
048	12	0.952309E+03	-.116721E+06	0.206250E+08	11	0.[illegible]31894E+07	0.574449[illegible]+06	-.1225667E+03
049	11	0.308000E+04	-.244586E+06	0.[illegible]09[illegible]63E+08	10	0.1957[illegible]0E+07	0.195[illegible]70[illegible]+06	-.7944340E+02
050	7	0.154000E+04	-.124126E+06	0.11[illegible]573E+08	6	0.1[illegible]52[illegible]1E+07	0.308765[illegible]+06	-.8060129E+02
WITHIN	131	0.19472[illegible]E+05	-.151141E+07	0.[illegible]09[illegible]08E+09	130	0.[illegible]65908E+08	0.718[illegible]37[illegible]+06	-.7761981E+02
AMONG	18	0.15[illegible]825E+05	0.572372E+06	0.[illegible]21[illegible]80E+09	17	0.100653E+09	0.592075E+07	0.0000000E+01
TOTAL	149	0.353544E+05	-.939040E+06	0.331186[illegible]+09	146	0.[illegible]6[illegible]244E+09	0.20[illegible]922[illegible]+07	0.0000000[illegible]+01

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 3.4896 DF = 18, 112
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 16.6653 DF = 18, 130
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 164.7141 DF = 1, 130

ALL UNLNC CTNS LOT-TO-LOT MK TRIAX TENSILE 77 DEG 1750 IN/MIN 600 PSI MODULUS

TABLE A-52

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
[illegible]	31	0.15[illegible]E+0[illegible]	0.4[illegible]E+04	0.6[illegible]E+05	30	0.1[illegible]E+05	0.5[illegible]E+03	0.[illegible]E+01
[illegible]	31	0.2[illegible]E+0[illegible]	0.[illegible]E+04	0.[illegible]E+05	30	0.[illegible]E+05	0.[illegible]E+03	0.[illegible]E+01
[illegible]	31	0.2[illegible]E+04	0.[illegible]E+04	0.[illegible]E+05	30	0.[illegible]E+04	0.[illegible]E+03	0.[illegible]E+01
[illegible]	26	0.[illegible]E+0[illegible]	0.[illegible]E+04	0.[illegible]E+05	25	0.[illegible]E+05	0.[illegible]E+03	0.[illegible]E+01
WITHIN	121	0.[illegible]E+04	0.[illegible]E+05	0.[illegible]E+05	120	0.[illegible]E+05	0.[illegible]E+03	0.[illegible]E+01
AMONG	3	0.[illegible]E+04	0.[illegible]E+03	0.[illegible]E+05	2	0.[illegible]E+05	0.[illegible]E+05	0.[illegible]E+01
TOTAL	124	0.[illegible]E+04	0.[illegible]E+05	0.[illegible]E+06	123	0.[illegible]E+06	0.[illegible]E+03	0.[illegible]E+01

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 1.[illegible] DF = 3. 117

F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = <1.5936 DF = 3. 120

F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 38.0704 DF = 1. 12[illegible]

AFT UNLVE CTNS LOT-TO-LOT MK TRIAX TENSILE MAX STRESS, 1750 IN/MIN, 600 PSI 77 D

TABEL A-53

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
[illegible]	31	0.16[illegible]E+04	0.1[illegible]E+01	0.[illegible]E-01	30	0.1[illegible]E-01	0.[illegible]E-03	0.[illegible]E-03
[illegible]	31	0.2[illegible]E+04	0.5[illegible]E+01	0.[illegible]E-01	30	0.[illegible]E-01	0.[illegible]E-03	0.[illegible]E-02
[illegible]	31	0.20[illegible]E+04	0.[illegible]E+01	0.[illegible]E-01	30	0.[illegible]E-02	0.[illegible]E-03	0.[illegible]E-02
724	28	0.16[illegible]E+04	0.[illegible]E+01	0.[illegible]E-01	27	0.1[illegible]E-01	0.[illegible]E-03	0.[illegible]E-02
WITHIN	121	0.69[illegible]E+04	0.1[illegible]E+02	0.[illegible]E-01	120	0.[illegible]E-01	0.[illegible]E-03	0.[illegible]E-02
AMONG	3	0.11[illegible]E+04	0.[illegible]E+01	0.[illegible]E-01	2	0.[illegible]E-01	0.[illegible]E-02	0.[illegible]E+01
TOTAL	124	0.81[illegible]E+04	0.[illegible]E+02	0.[illegible]E-01	122	0.[illegible]E-01	0.[illegible]E-03	0.[illegible]E+00

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 1.9331 DF = 3. 117

F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 6.1771 DF = 3. 120

F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 43.0660 DF = 1. 120

ANT UNLNO CYLS LOT-TO-LOT HR TRIX TENSILE STR & RUPTURE. 1750 AN/SQ IN. 650 PSI

TABLE A-54

ANALYSIS OF COVARIANCE TABLE -

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS x	xy	y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
ARG	31	0.1[illegible]E+04	-.6[illegible]E+05	0.1[illegible]E+06	30	0.1[illegible]E+08	0.3[illegible]E+06	-.3[illegible]E+02
ARS	31	0.2[illegible]E+04	-.4[illegible]E+05	0.[illegible]E+06	30	0.[illegible]E+08	0.11[illegible]E+07	-.2[illegible]E+02
ARB	31	0.2[illegible]E+04	-.5[illegible]E+05	0.[illegible]E+06	30	0.[illegible]E+08	0.11[illegible]E+07	-.1[illegible]E+02
TOT	93	0.1[illegible]E+04	-.[illegible]E+05	0.[illegible]E+06	27	0.[illegible]E+08	0.[illegible]E+06	-.[illegible]E+01
WITHIN	121	0.65[illegible]E+04	-.211254E+06	0.[illegible]E+09	120	0.101522E+09	0.846017E+06	-.3045285E+02
AMONG	3	0.[illegible]E+04	0.40[illegible]E+05	0.[illegible]E+07	2	0.331645E+07	0.175623E+07	0.000000E+00
TOTAL	124	0.81[illegible]E+04	-.[illegible]E+06	0.[illegible]E+09	122	0.[illegible]E+09	0.[illegible]E+06	0.000000E+00

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 0.6831 DF = 3, 117

F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 3.0576 DF = 3, 120

F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 7.6041 DF = 1, 120

ANT UNIAC CTMS LOT-TO-LOT HR TRIAX TENSILE MODULUS, 1750 JN/MIN, 600 PSI, 77 DEG

TABLE A-55

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
UNLIKE	107	0.167220E+05	0.216940E+05	0.2469[illegible]3E+07	106	0.244149E+07	0.230229E+05	0.129733[illegible]E+01
LIKE	56	0.37[illegible]E+04	0.2[illegible]5[illegible]E+05	[illegible]E+06	55	0.[illegible]97d1E+06	0.114[illegible]E+05	0.75[illegible]E+01
WITHIN	163	0.205080E+05	0.5[illegible]429[illegible]E+05	0.[illegible]E+07	162	0.3[illegible]350E+07	0.197[illegible]E+05	0.245[illegible]87E+01
AMONG	1	0.119472E+05	0.773706E+05	0.501024E+06	0	.2[illegible]75[illegible]E+02	0.000000E+00	0.000000E+00
TOTAL	164	0.324552E+05	0.127799E+06	0.[illegible]53E+07	163	0.3[illegible]529E+07	0.203[illegible]E+05	0.000000E+00

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = [illegible]4075 DF = 1, 161
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = [illegible].1784 DF = 1, 162
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = [illegible].[illegible]05 DF = 1, 162

ANT LIKE VS UNLIKE CTNS STRESS RELAXATION 77 DEG F 1% STRAIN MODULUS AT 10 SEC

TABLE A-56

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
UNLINED	107	0.157220E+05	0.111540E+05	0.[illegible]E+06	106	0.950600E+06	0.882641E+04	0.667025E+00
LINED	56	0.378E04E+04	0.194107E+05	0.[illegible]E+06	55	0.208844E+06	0.379716E+04	0.512691E+01
WITHIN	163	0.265066E+05	0.305647E+05	0.[illegible]E+07	162	0.[illegible]E+07	0.744851E+04	0.149637E+01
AMONG	1	0.119472E+05	0.341213E+05	0.[illegible]E+05	0	.365525E+01	0.000000E+00	0.000000E+00
TOTAL	164	0.324552E+05	0.646886E+05	0.[illegible]E+07	163	0.121992E+07	0.748419E+04	0.000000E+00

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 8.6783 DF = 1, 161

F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 1.8909 DF = 1, 162

F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 6.1198 DF = 1, 162

ANT LINED VS UNLINED CTNS STRESS RELAXATION 77 DEG F 1% STRAIN MODULUS AT 1000 S

TABLE A-57

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
ALB	47	0.25+80[illegible]E+04	-.31[illegible]500E+04	0.214[illegible]00E+06	46	0.3[illegible]899E+06	0.[illegible]E+04	-.123[illegible]E+01
ALT	56	0.27[illegible]E04[illegible]+04	0.2[illegible]735[illegible]E+05	0.[illegible]80E+06	55	[illegible]797E+06	0.114[illegible]E+05	0.758[illegible]E+01
WITHIN	103	0.63[illegible]46[illegible]+04	0.25[illegible]700E+05	[illegible]E+07	102	0.10[illegible]79E+07	0.10[illegible]E+05	0.+02[illegible]E+01
AMONG	1	[illegible]	0.490700E+04	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
TOTAL	104	0.65790[illegible]E+04	0.3047700E+05	0.426571E+07	103	0.11[illegible]53E+07	0.109[illegible]E+05	[illegible]

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 12.7866 DF = 1, 101
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 6.6160 DF = 1, 102
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 5.9036 DF = 1, 102

ALB VS ALT LINED CARTONS STRESS RELAXATION 77 DEG F 1% STRAIN MODULUS AT 10 SEC

TABLE A-58

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
ANG	47	0.256860E+04	-.140506E+04	0.978626E+05	46	0.976001E+05	0.212170E+04	-.558806E+00
AOT	56	0.378604E+04	0.194107E+05	0.100361E+06	55	0.364E+06	0.279716E+04	0.512691E+01
WITHIN	103	0.635464E+04	0.179757E+05	0.476196E+05	102	0.353305E+06	0.346425E+04	0.282991E+01
AMONG	1	0.225621E+03	0.251231E+04	0.279855E+05	1	0.359215E+01	0.359215E+01	0.111366E+02
TOTAL	104	0.657910E+04	0.205060E+05	0.474419E+06	103	0.377165E+06	0.359467E+04	0.308160E+01

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 16.3851 DF = 1. 101

F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 4.4196 DF = 1. 102

F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 14.5967 DF = 1. 102

ANG VS AOT LINED CARTONS STRESS RELAX, 77 DEG F, 1% STRAIN, MODULUS AT 1000 SEC

TABLE A-59

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
ANA	32	0.230569E+04	0.205126E+05	0.110146E+07	31	0.917996E+06	0.296128E+05	0.889625E+01
ANB	53	0.813087E+04	0.252520E+05	0.183795E+07	52	0.120953E+07	0.232601E+05	0.310569E+01
WITHIN	85	0.104266E+05	0.457640E+05	0.293941E+07	84	0.216775E+07	0.258425E+05	0.438496E+01
AMONG	1	0.677753E+02	-.120960E+05	0.247104E+06	0	.293125E+02	0.000000E+00	0.100000E+01
TOTAL	86	0.111143E+05	0.329140E+05	0.268320E+07	85	0.256456E+07	0.298184E+05	0.000000E+00

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 2.3498 DF = 1. 85
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 13.3158 DF = 1. 84
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 7.7050 DF = 1. 84

ANA VS ANB UNLINED CRTNS STRESS RELAXATION 77 DEG F 1% STRAIN MODULUS AT 10 SEC

TABLE A-60

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT*
ARA	32	0.2305E+04	0.6540E+04	0.3[illegible]E+05	31	[illegible]E+06	0.8674[illegible]E+04	0.3840[illegible]E+01
ARB	53	0.8120E+04	0.1723E+05	0.4992E+06	52	0.4[illegible]E+06	0.8[illegible]E+04	0.2120[illegible]E+01
WITHIN	85	0.1043E+05	0.2377E+05	0.7954E+06	84	0.7301E+06	0.[illegible]E+04	0.2[illegible]E+01
AMONG	1	0.6777E+03	-.7935E+04	0.9285E+05	0	.6125E+01	0.0000E+00	0.0000E+00
TOTAL	86	0.1111E+05	0.1815E+05	0.8883E+06	85	0.8586E+06	0.1010E+05	0.[illegible]E+01

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 1.6685 DF = 1. 85
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 14.7782 DF = 1. 84
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 7.5841 DF = 1. 84

ARA VS ARB UNLINED CRTDS STRESS RELAXATION 77 DEG F 1% STRAIN MODULUS AT 1000 S

TABLE A-61

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
A/A	32	0.230565E+04	0.205120E+05	0.1[illegible]46E+07	31	0.917996E+06	0.29[illegible]8E+05	0.889[illegible]9E+01
A/B	53	0.81[illegible]87E+04	0.252526E+05	0.[illegible]793E+07	52	0.1[illegible]953E+07	0.23[illegible]1E+05	0.310[illegible]92E+01
A/T	107	0.1[illegible]E+05	0.[illegible]940E+05	[illegible]E+07	106	0.244147E+07	0.230827E+05	0.1297333E+01
WITHIN	192	0.271506E+05	0.674538E+05	0.[illegible]04E+07	191	0.[illegible]49E+07	0.245675E+05	0.2483857E+01
AMONG	2	0.815819E+04	-.379090E+05	0.[illegible]24E+06	1	0.151371E+06	0.151371E+06	0.000000[illegible]E+00
TOTAL	194	0.353167E+05	0.295490E+05	0.[illegible]57E+07	193	0.516084E+07	0.267401E+05	0.000000[illegible]E+00

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 2.5129 DF = 2, 189
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 9.9766 DF = 2, 191
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 6.8230 DF = 1, 191

A/A VS AN8&ANT UNLTD CTNS STRESS RELAXATION 77 DEG F 1% STRAIN MODULUS AT 10 SEC

TABLE A-62

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
ANA	32	0.235569E+04	0.8e540CE+04	[illegible]	31	[illegible]	0.967413E+04	0.384[illegible]
ANB	53	0.812087E+04	0.172380E+05	0.[illegible]	52	1.455981E+06	0.278867E+04	0.212[illegible]
ANT	107	0.1e7e20E+05	0.111546E+05	[illegible]	106	0.[illegible]	0.982e+1[illegible]	0.e67[illegible]
WITHIN	192	0.271586E+05	0.37e4ECE+05	[illegible]	191	0.1e[illegible]	0.[illegible]	0.1371427E+01
AMONG	2	0.6158195E+04	-.146540E+05	0.9e9110E+05	1	0.725e90E+05	0.725e90E+05	0.000000[illegible]
TOTAL	194	0.353167E+05	0.225920E+05	0.183738E+07	193	0.182292E+07	0.944520E+04	0.000000[illegible]

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 1.5812 DF = 2, 189

F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 7.e710 DF = 2, 191

F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 5.7819 DF = 1, 191

ANA VS ABSANT UNLND CTNS STRESS RELAXATION 77 DEG F 1% STRAIN MODULUS AT 1000 S

TABLE A-63

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
711	8	0.366000E+03	-.670000E+03	0.[illegible]9E+05	7	0.3[illegible]25E+05	0.463750E+04	-.1830[illegible]E+01
712	8	0.294000E+03	0.365000E+04	0.[illegible]10E+05	7	[illegible]43E+05	0.148345E+04	0.130952[illegible]E+02
713	8	0.266000E+03	0.271689E+04	0.[illegible]00E+05	7	0.[illegible]42E+05	0.299203E+04	0.102[illegible]11E+02
819	8	0.5[illegible]	0.119337E+04	[illegible]30E+05	7	0.435844E+05	0.622634E+04	-.2046449E+01
820	8	0.341559E+03	0.315112E+04	0.342250E+05	7	0.515160E+04	0.735943E+03	-.922572[illegible]E+01
821	5	0.337500E+03	0.427500E+04	0.582[illegible]0E+05	4	0.[illegible]5402E+04	0.1038505+04	-.1266666E+02
WITHIN	45	0.218906E+04	0.145162E+05	0.281710E+06	44	0.[illegible]450E+06	0.421476E+04	0.6631247E+01
AMONG	5	0.120345E+04	0.121937E+05	0.365[illegible]0E+06	4	0.241939E+06	0.6046486E+05	0.0000000E+00
TOTAL	50	0.339251E+04	0.267099E+05	0.647200E+06	49	0.436907E+06	0.891647E+04	0.0000000E+00

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 4.5931 DF = 5, 39
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 11.9322 DF = 5, 44
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 22.6389 DF = 1, 44

ANT LINED CTHS LOT-TO-LOT STRESS RELAXATION 77 DEG 1% STRAIN MODULUS AT 10 SECS

TABLE A-64

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
711	8	0.366000E+03	-.190000E+03	0.232710E+05	7	0.131124E+05	0.187177E+04	-.5191257E+00
712	8	0.294000E+03	0.203000E+04	0.168590E+05	7	0.207234E+04	0.410334E+03	0.690479[illegible]E+01
713	8	0.266000E+03	0.209337E+04	0.214730E+05	7	0.354850E+04	0.506071E+03	0.786582[illegible]E+01
819	8	0.584000E+03	0.245337E+04	0.119560E+05	7	0.108494E+05	0.154992E+04	0.420098[illegible]E+01
820	8	0.341559E+03	0.227337E+04	0.172100E+05	7	0.206868E+04	0.295526E+03	0.665588[illegible]E+01
821	5	0.337500E+03	0.330000E+04	0.347340E+05	4	0.246734E+04	0.616834E+03	0.977777[illegible]E+01
WITHIN	45	0.218906E+04	0.119601E+05	0.123603E+06	44	0.582578E+05	0.132404E+04	0.5463593E+01
AMONG	5	0.120345E+04	0.673694E+04	0.125139E+06	4	0.874032E+05	0.218508E+05	0.0000000E+00
TOTAL	50	0.339251E+04	0.186991E+05	0.248742E+06	49	0.145675E+06	0.297296E+04	0.0000000E+00

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 5.0697 DF = 5. 39

F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 13.2047 DF = 5. 44

F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 49.3529 DF = 1. 44

ANT LINED CTNS LOT-TO-LOT STRESS RELAXATION 77 DEG 1% STRAIN MODULUS AT 1000 SEC

TABLE A-65

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
[illegible]	11	0.350250E+03	0.901250E+04	0.[illegible]92E+06	10	0.[illegible]6E+06	0.[illegible]6E+05	0.2573161E+02
[illegible]	11	0.672250E+03	-.755000E+03	0.[illegible]70E+05	10	0.[illegible]5E+05	0.[illegible]4	-.8055775E+00
WITHIN	22	0.122250E+04	0.825750E+04	0.[illegible]9E+06	21	0.[illegible]3E+06	0.2949922E+05	0.6754601E+01
AMONG	1	0.725000E+02	0.446250E+04	0.[illegible]7E+07	0	-.375000E+00	0.000000E+00	0.0000000E+00
TOTAL	23	0.129800E+04	0.127200E+05	0.946196E+06	22	0.8[illegible]51E+06	0.373342E+05	0.0000000E+00

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 7.9866 DF = 1, 21

F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 6.8432 DF = 1, 21

F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 1.8908 DF = 1, 21

ANA UNLND CARTONS LOT-TO-LOT STRESS RELAXATION MODULUS AT 10 SEC, 1% STRAIN

TABLE A-66

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
040	11	0.350250E+03	0.476000E+04	0.173800E+06	10	0.108565E+06	0.108565E+05	0.136473E+02
044	11	0.872250E+03	-.120000E+04	0.169100E+05	10	0.171491E+05	0.171491E+04	-.137575E+01
WITHIN	22	0.122250E+04	0.356000E+04	0.192600E+06	21	0.182116E+06	0.867220E+04	0.292842E+01
AMONG	1	0.735000E+02	0.210000E+04	0.600000E+05	1	0.000000E+00	0.000000E+00	0.000000E+00
TOTAL	23	0.129600E+04	0.568000E+04	0.252600E+06	22	0.227706E+06	0.103503E+05	0.000000E+00

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 8.9730 DF = 1. 20
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 5.2570 DF = 1. 21
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 1.2089 DF = 1. 21

ANA UNLNE CARTONS LOT-TO-LOT STRESS RELAXATION MODULUS AT 1000 SEC. 1% STRAIN

TABLE A-67

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
504	20	0.240257E+04	-.241453E+03	0.262[illegible]1E+04	19	0.[illegible]3006E+06	0.336845E+05	-.1004977E+02
535	20	0.125000E+04	-.152931E+04	0.[illegible]7E+04	19	0.[illegible]11E+06	0.243479E+05	-.1213739E+01
696	20	0.148800E+04	-.539000E+04	0.[illegible]7E+05	19	0.[illegible]343E+06	0.117022E+05	-.3624819E+01
724	23	0.115562E+04	-.[illegible]25E+03	0.197799E+06	22	0.157497E+06	0.897711E+04	-.5138025E+00
822	5	0.150000E+01	-.700000E+02	0.[illegible]0E+04	4	0.253333E+04	0.633333E+03	-.4666666E+02
WITHIN	86	0.62977[illegible]E+04	-.317282E+05	0.178879E+07	87	0.162899E+07	0.187241E+05	-.5037275E+01
AMONG	4	0.705299E+04	0.423792E+05	0.[illegible]9E+06	3	0.154322E+06	0.514407E+05	0.000000[illegible]E+00
TOTAL	92	0.133507E+05	0.106560E+05	0.219776E+07	91	0.21[illegible]925E+07	0.240577E+05	0.000000[illegible]E+00

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 1.4705 DF = 4, 83
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 7.4805 DF = 4, 87
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 8.5344 DF = 1, 87

ANT UNLND CARTONS LOT-TO-LOT STRESS RELAXATION MODULUS AT 10 SEC, 1% STRAIN

TABLE A-68

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
ABF	20	0.14[illegible]E+04	-.39[illegible]E+04	0.92[illegible]E+05	19	0.[illegible]92E+05	0.4313[illegible]E+04	-.262[illegible]E+01
724	23	0.11[illegible]E+04	-.177625E+04	3.[illegible]E+05	22	0.[illegible]420E+05	0.3942[illegible]E+04	-.[illegible]E+01
684	20	0.240257E+04	-.124771E+05	0.[illegible]E+06	19	0.2[illegible]718E+06	0.1196[illegible]E+05	-.519[illegible]E+01
E35	20	0.12[illegible]E+04	-.540000E+03	.157[illegible]E+06	19	0.156[illegible]E+06	0.103591[illegible]E+05	-.746031[illegible]E+00
E22	5	0.150000E+01	-.250000E+02	0.[illegible]E+04	4	0.106E71E+04	0.266677[illegible]E+03	-.233333[illegible]E+02
WITHIN	88	0.62977[illegible]E+04	-.191284E+05	0.[illegible]E+06	87	0.615[illegible]E+06	0.707471E+04	-.303735[illegible]E+01
AMONG	4	0.705299E+04	0.233634E+05	0.[illegible]E+06	3	0.110400E+06	0.368001E+05	0.[illegible]E+01
TOTAL	92	0.133507E+05	0.42350[illegible]E+04	0.[illegible]92E+06	91	0.[illegible]048E+06	0.945108E+04	0.[illegible]E+00

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 0.7399 DF = 4. 83
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 8.5417 DF = 4. 87
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 8.2125 DF = 1. 87

ANT UNLND CARTONS LOT-TO-LOT STRESS RELAXATION MODULUS AT 1000 SEC. 1% STRAIN

TABLE A-69

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
UNLINE	236	0.431144E+05	0.181489E+06	0.2649266E+07	235	0.187866E+07	0.799430E+04	0.4209471E+01
LINED	53	0.466359E+04	-.253100E+04	0.1311940E+05	52	0.797302E+05	0.153328E+04	-.5427253E+00
WITHIN	289	0.477779E+05	0.1739556E+06	0.2782367E+07	288	0.2663457E+07	0.7413004E+04	0.3745220E+01
ANCOVA	1	0.8[illegible]E+04	-.[illegible]E+05	[illegible]	1	0.1137197E+03	0.0000000E+00	0.0000000E+01
TOTAL	290	0.5443880E+05	0.1803606E+06	0.2775581E+07	289	0.2680343E+07	0.7970134E+04	0.0000000E+00

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 13.3276 DF = 1, 287
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 35.0598 DF = 1, 288
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 94.9119 DF = 1, 289

ANT LINED VS UNLINED CARTONS TCLE (TCLE ABOVE GLASS POINT)

TABLE A-70

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
UNLND	287	0.584540E+05	0.164900E+03	0.933400E+04	286	0.913353E+04	0.314459E+02	0.288730E-02
LINED	53	0.466253E+04	-.468000E+03	0.239000E+03	52	0.185034E+03	0.355835E+01	-.100313E+01
WITHIN	340	0.611175E+05	-.303500E+03	0.963600E+04	339	0.963404E+04	0.284274E+02	-.496838E-02
AMONG	1	0.104809E+05	-.129400E+04	0.161200E+03	0	.796850E-01	0.000000E+00	0.000000E+00
TOTAL	341	0.715777E+05	-.159900E+04	0.952600E+04	340	0.964028E+04	0.283831E+02	0.000000E+00

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 2.4561 DF = 1. 338
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 6.7008 DF = 1. 339
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANCE = 0.0811 DF = 1. 339

ANT LINED VS UNLND CARTONS TCLE (GLASS POINT)

TABLE A-71

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
ANA	105	0.462836E+05	0.572437E+03	0.299106E+04	104	0.298706E+04	0.287217E+02	0.123663[illegible]E-01
ANB	281	0.741542E+05	0.237100E+04	0.510450E+04	280	0.502822E+04	0.179579E+02	0.319[illegible]E-01
WITHIN	386	0.115112E+06	0.294344E+04	0.809556E+04	385	0.802360E+04	0.208410E+02	0.255700[illegible]E-01
ANLNG	1	0.101[illegible]E+03	-0.167437E+03	0.277[illegible]E+03	0	0.157106E+01	0.000000E+00	0.000000[illegible]E+00
TOTAL	387	0.115214E+06	0.277600E+04	0.837600E+04	386	0.831111E+04	0.215314E+02	0.000000[illegible]E+00

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 0.4083 DF = 1, 384

F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 13.7361 DF = 1, 385

F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 2.5113 DF = 1, 385

ANA UNLND VS ANB UNLND CAPTONS TCLE (TCLE ABOVE GLASS POINT)

TABLE A-72

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	SUMS OF SQUARES AND PRODUCTS (CORRECTED) X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
ANA	99	0.379958E+05	0.220961E+06	0.230116E+07	98	0.921485E+06	0.940286E+04	0.602603E+01
ANB	281	0.741842E+05	-.140340E+05	0.814283E+07	280	0.814018E+07	0.290721E+05	-.189177E+00
WITHIN	380	0.112173E+06	0.214527E+06	0.304644OE+08	379	0.100322E+08	0.264703E+05	0.191592E+01
ANOVA	1	0.425625E+03	0.884900E+04	0.183750E+06	1	-.154969E+03	0.000000E+00	0.000000E+00
TOTAL	381	0.112616E+06	0.221776E+06	0.109513E+08	380	0.101145E+08	0.266172E+05	0.000000E+00

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 40.4879 DF = 1, 378
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 3.1096 DF = 1, 379
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 15.5564 DF = 1, 379

ANA UNLND VS ANB UNLND CARTONS TCLE (GLASS POINT)

TABLE A-73

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
ANA	99	0.379953E+05	0.226986E-01	0.230280E-07	98	0.922778E-08	0.941610E-10	0.602669E-04
ANB	281	0.741942E+05	-.141239E-02	0.819410E-07	280	0.814141E-07	0.290765E-09	-.190360E-07
ANT	236	0.431144E+05	0.181572E-01	0.664470E-07	235	0.185003E-07	0.787246E-10	0.421139E-04
WITHIN	616	0.155294E+06	0.396433E-01	0.320917E-06	615	0.120797E-06	0.196418E-09	0.255279E-04
AMONG	2	0.120631E+05	-.908095E-02	0.927600E-08	1	0.243596E-08	0.243596E-08	0.000000E+00
TOTAL	618	0.167357E+06	0.305624E-01	0.140190E-06	617	0.134605E-06	0.218166E-09	0.000000E+00

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 31.7996 DF = 2, 613
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 35.1596 DF = 2, 615
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 51.5235 DF = 1, 615

ANA VS ANB VS ANT UNLINED CAPTONS TCLE (TCLE ABOVE GLASS POINT)

TABLE A-74

ANALYSIS OF COVARIANCE TABLE

SOURCE	DF	CORRECTED SUMS OF SQUARES AND PRODUCTS X	XY	Y	DF	DEVIATIONS ABOUT REGRESSION SS	MS	REGRESSION COEFFICIENT
ANA	105	0.405263E+05	0.572437E+03	0.299506E+04	104	0.298706E+04	0.287217E+02	0.139063[illegible]E-01
ANB	281	0.741842E+05	0.237100E+04	0.510400E+04	280	0.502822E+04	0.179579E+02	0.319[illegible]E-01
ANT	287	0.564540E+05	0.163066E+03	0.513400E+04	286	0.513353E+04	0.214459E+02	0.288730[illegible]E-0[illegible]
WITHIN	673	0.171566E+06	0.310644E+04	0.142331E+05	672	0.141768E+05	0.210964E+02	0.181063[illegible]E-01
AMONG	2	0.682750E+04	0.130756E+04	0.600937E+03	1	0.350521E+03	0.350521E+03	0.000000[illegible]E+0[illegible]
TOTAL	675	0.175394E+06	0.441400E+04	0.148340E+05	674	0.147248E+05	0.218469E+02	0.000000[illegible]E+0[illegible]

F RATIO FOR TESTING DIFFERENCES BETWEEN SLOPES = 0.6632 DF = 2, 670
F RATIO FOR TESTING DIFFERENCES BETWEEN ELEVATIONS = 12.9872 DF = 2, 672
F RATIO FOR TESTING SIGNIFICANCE OF COVARIANT = 2.6861 DF = 1, 672

ANA VS ANB VS ANT UNLINED CARTONS ICLE (GLASS POINT)

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This report contains test results from testing of Minuteman III, Stage III propellant manufactured by Aerojet Solid Propulsion Company and Thiokol Corporation, Wasatch Division. These results are compared statistically with propellant of similar ages from Minuteman II Stage II.

Regressions are given for only statistically significant parameters from very low rate tensile, high rate biaxial tensile under pressure, stress relaxation and thermal coefficient of linear expansion tests. There are some significant regressions in each of these tests. (OVER)

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Case liner bonds also show significant changes which are potentially life limiting.

Significant changes in other parameters may be the result of limited testing, both in numbers and ages.

Analysis of covariance for test data from lined and unlined cartons of Stage II and Stage III propellant and for the four tests listed above are given in the statistical appendix.